

Supplementary Material A

for the article

Using the Sustainability Monitoring and Assessment Routine (SMART) for Systematic Analysis of Trade-offs and Synergies between Sustainability Dimensions and Themes at Farm Level

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SAFA Structure of Dimensions, Themes and Sub Themes

Tab. S1 Overview of dimensions, themes, sub-themes, objectives and explanations of the objectives for farm level

Dimension	Theme	Sub-Theme	Sub-Theme Objective	Explanation Sub-Theme Objective
Good Governance	Corporate Ethics	Mission Statement	The enterprise has made its commitment to all areas of sustainability clear to the public, to all personnel and other stakeholders through publishing a mission statement or other similar declaration (such as a code of conduct or vision statement) that is binding for management and employees or members.	It is assessed if a farm defines guidance for sustainability and which requirements it sets for their economic operations (e.g. profit maximisation or if the provision of healthy food and the preservation of nature are prioritised). As small farm holders only seldom put such information in a written form, verbally declared intentions and information based on the style of the farm management are also considered for the assessment.
		Due Diligence	The enterprise is pro-active in considering its external impacts before making decisions that have long-term impacts for any area of sustainability. This is accomplished through the enterprise following appropriate procedures such as risk assessment and others that ensure that stakeholders are informed, engaged and respected.	It is assessed, how carefully and forward-looking a farm deals with impacts outside the farm which impacts third parties (e.g. water- and air pollution or when using risk technologies such as genetic engineering).
	Accountability	Holistic Audits	All areas of sustainability in the SAFA dimensions that pertain to the enterprise are monitored internally in an appropriate manner, and wherever possible are reviewed according to recognized sustainability reporting systems.	It is assessed, how systematically and extensively a farm takes into account and carries out assessments of all four dimensions of sustainability (Good Governance, Environmental Integrity, Economic Resilience and Social Well-Being).
		Responsibility	Senior management and/or owners of enterprise regularly and explicitly evaluate the enterprise's performance against its mission or code of conduct.	It is assessed, how regularly and extensively the farm is critically questioning and assessing their own performance in regards to sustainability and is seeking ways to improve.

Dimension	Theme	Sub-Theme	Sub-Theme Objective	Explanation Sub-Theme Objective
		Transparency	All procedures, policies, decisions or decision-making processes are accessible where appropriate publicly, and made available to stakeholders including personnel and others affected by the enterprise's activities.	It is assessed, how transparent farm decisions are communicated to different stakeholders (for e.g. employees, residents or environmental groups).
	Participation	Stakeholder Dialogue	The enterprise pro-actively identifies stakeholders, which include all those affected by the activities of the enterprise (including any stakeholders unable to claim their rights), and ensures that all are informed, engaged in critical decision making, and that their input is duly considered.	It is assessed, if and how the farm identifies possible stakeholders and if they are informed or involved in critical decisions.
		Grievance Procedures	All stakeholders (including as stated above, those who cannot claim their rights, personnel, and any stakeholders in or outside of the enterprise) have access to appropriate grievance procedures, without a risk of negative consequences.	It is assessed, if and how the farm gives the opportunity to stakeholders (e.g. employees or residents) to present their concern about possible or current conflicts without having to fear consequences.
		Conflict Resolution	Conflicts between stakeholder interests and the enterprise's activities are resolved through collaborative dialogue (i.e. arbitrated, mediated, facilitated, conciliated or negotiated), based on respect, mutual understanding and equal power.	It is assessed, if the farm tries to resolve conflicts by taking stakeholders into consideration.

Dimension	Theme	Sub-Theme	Sub-Theme Objective	Explanation Sub-Theme Objective
	Rule of Law	Legitimacy	The enterprise is compliant with all applicable laws, regulations and standards voluntarily entered into by the enterprise (unless as part of an explicit campaign of non-violent civil disobedience or protest) and international human rights standards (whether legally obligated or not).	
		Remedy, Restoration & Prevention	In case of any legal infringements or any other identified breach of legal, regulatory, international human rights, or voluntary standard, the enterprise immediately puts in place an effective remedy and adequate actions for restoration and further prevention are taken.	
		Civic Responsibility	Within its sphere of influence, the enterprise supports the improvement of the legal and regulatory framework on all dimensions of sustainability and does not seek to avoid the impact of human rights, or sustainability standards, or regulation through the corporate veil, relocation, or any other means.	It is assessed, if and how the farm engages in improving the legal framework towards better sustainability within their ability and engages in social or environmental issues within the community.
		Resource Appropriation	Enterprises do not reduce the existing rights of communities to land, water and resources, and operations are carried after informing affected communities by providing information, independent advice and building capacity to self-organize for the purposes of representation.	It is assessed, that when buying resources (e.g. farm inputs or land) the farm makes sure that no rights of third parties are infringed or reduced.

Dimension	Theme	Sub-Theme	Sub-Theme Objective	Explanation Sub-Theme Objective
	Holistic Management	Sustainability Management Plan	A sustainability plan for the enterprise is developed which provides a holistic view of sustainability and considers synergies and trade-offs between dimensions, including each of the environmental, economic, social and governance dimensions.	It is assessed, if the farm plans the improvement of their sustainability performance systematically and bases future farm decisions on this plans. For small farm holders, these plans do not have to be in written form necessarily.
		Full-Cost Accounting	The business success of the enterprise is measured and reported taking into account direct and indirect impacts on the economy, society and physical environment (e.g. triple bottom line reporting), and the accounting process makes transparent both direct and indirect subsidies received, as well as direct and indirect costs externalized.	It is assessed, if the farm is considering external environmental and social costs (nature consumption, exploitation of socially weak groups etc.) and direct and indirect subsidies received in their profitability calculation or accounts. As this is hardly possible, especially for farms, due to missing data, poor ratings are common.

Environmental Integrity	Atmosphere	Greenhouse Gases	The emission of GHG is contained.
		Air Quality	The emission of air pollutants is prevented and ozone depleting substances are eliminated.
	Water	Water Withdrawal	Withdrawal of ground and surface water and/or use does not impair the functioning of natural water cycles and ecosystems and human, plant and animal communities.
		Water Quality	The release of water pollutants is prevented and water quality is restored.
	Land	Soil Quality	Soil characteristics provide the best conditions for plant growth and soil health, while chemical and biological soil contamination is prevented.

Dimension	Theme	Sub-Theme	Sub-Theme Objective	Explanation Sub-Theme Objective
		Land Degradation	No land is lost through soil degradation and desertification and degraded land is rehabilitated.	
	Biodiversity	Ecosystem Diversity	The diversity, functional integrity and connectivity of natural, semi-natural and agrifood ecosystems are conserved and improved.	
		Species Diversity	The diversity of wild species living in natural and semi-natural ecosystems, as well as the diversity of domesticated species living in agricultural, forestry and fisheries ecosystems is conserved and improved.	
		Genetic Diversity	The diversity of populations of wild species, as well as the diversity of varieties, cultivars and breeds of domesticated species, is conserved and improved.	
	Materials and Energy	Material Use	Material consumption is minimized and reuse, recycling and recovery rates are maximized.	
		Energy Use	Overall energy consumption is minimized and use of sustainable renewable energy is maximized.	
		Waste Reduction & Disposal	Waste generation is prevented and is disposed of in a way that does not threaten the health of humans and ecosystems and food loss/waste is minimized.	
	Animal Welfare	Animal Health	Animals are kept free from hunger and thirst, injury and disease.	

Dimension	Theme	Sub-Theme	Sub-Theme Objective	Explanation Sub-Theme Objective
		Freedom from Stress	Animals are kept under species-appropriate conditions and free from discomfort, pain, injury and disease, fear and distress.	
Economic Resilience	Investment	Internal Investment	In a continuous, foresighted manner, the enterprise invests into enhancing its sustainability performance.	
		Community Investment	Through its investments, the enterprise contributes to sustainable development of a community.	
		Long-Ranging Investment	Investments into production facilities, resources, market infrastructure, shares and acquisitions aim at long-term sustainability rather than maximum short-term profit.	
		Profitability	Through its investments and business activities, the enterprise has the capacity to generate a positive net income.	
	Vulnerability	Stability of Production	Production (quantity and quality) is sufficiently resilient to withstand and be adapted to environmental, social and economic shocks.	
		Stability of Supply	Stable business relationships are maintained with a sufficient number of input suppliers and alternative procurement channels are accessible.	
		Stability of Market	Stable business relationships are maintained with a sufficient number of buyers, income structure is diversified and alternative marketing channels are accessible.	

Dimension	Theme	Sub-Theme	Sub-Theme Objective	Explanation Sub-Theme Objective
		Liquidity	Financial liquidity, access to credits and insurance (formal and informal) against economic, environmental and social risk enable the enterprise to withstand shortfalls in payment.	
		Risk Management	Strategies are in place to manage and mitigate the internal and external risks (i.e. price, production, market, credit, workforce, social, environmental) that the enterprise could face to withstand their negative impact.	
	Product Quality & Information	Food Safety	Food hazards are systematically controlled and any contamination of food with potentially harmful substances is avoided.	
		Food Quality	The quality of food products meets the highest nutritional standards applicable to the respective type of product.	
		Product Information	Products bear complete information that is correct, by no means misleading and accessible for consumers and all members of the food chain.	
	Local Economy	Value Creation	Enterprises benefit local economies through employment and through payment of local taxes.	
		Local Procurement	Enterprises substantially benefit local economies through procurement from local suppliers.	

Dimension	Theme	Sub-Theme	Sub-Theme Objective	Explanation Sub-Theme Objective
Social Well-Being	Decent Livelihood	Quality of Life	All producers and employees in enterprises of all scales enjoy a livelihood that provides a culturally appropriate and nutritionally adequate diet and allows time for family, rest and culture.	Besides the conditions for employees of the farm, it is assessed, that when buying farm inputs, the farm also considers that employees and their relatives on all levels of the supply chain enjoy an adequate livelihood.
		Capacity Development	Through training and education, all primary producers and personnel have opportunities to acquire the skills and knowledge necessary to undertake current and future tasks required by the enterprise, as well as the resources to provide for further training and education for themselves and members of their families.	Besides the conditions for employees of the farm, it is assessed, that when buying farm inputs, the farm also considers that employees and their relatives on all levels of the supply chain have adequate possibilities for education and training. It is also assessed whether the farm provides education and/or employs trainees.
		Fair Access to Means of Production	Primary producers have access to the means of production, including equipment, capital and knowledge.	It is assessed, when buying farm inputs, whether the primary producers have a fair access to means of production.
	Fair Trading Practices	Responsible Buyers	The enterprise ensures that a fair price is established through negotiations with suppliers that allow them to earn and pay their own employees a living wage, and cover their costs of production, as well as maintain a high level of sustainability in their practices. Negotiations and contracts (verbal or written) are transparent, based on equal power, terminated only for just cause, and terms are mutually agreed upon.	It is assessed, when buying farm inputs, whether the farm pays attention to fair contracts and prices and therefore also enables the suppliers to work in a highly sustainable way.

Dimension	Theme	Sub-Theme	Sub-Theme Objective	Explanation Sub-Theme Objective
		Rights of Suppliers	The enterprises negotiating a fair price explicitly recognize and support in good faith suppliers' rights to freedom of association and collective bargaining for all contracts and agreements.	It is assessed, that when buying farm inputs, the farm considers that the rights of suppliers on all levels of the supply chain remain respected.
	Labour Rights	Employment Relations	Enterprises maintain legally-binding transparent contracts with all employees that are accessible and cover the terms of work and employment is compliant with national laws on labour and social security.	Besides the conditions for employees of the farm, it is assessed, that when buying farm inputs, the farm also considers that all employees and their relatives on all levels of the supply chain enjoy adequate working conditions/contracts.
		Forced Labour	The enterprise accepts no forced, bonded or involuntary labour, neither in its own operations nor those of business partners.	
		Child Labour	The enterprise accepts no child labour that has a potential to harm the physical or mental health or hinder the education of minors, neither in its own operations nor those of business partners.	
		Freedom of Association and Right to Bargaining	All persons in the enterprise can freely execute the rights to: negotiate the terms of their employment individually or as a group; form or adhere to an association defending workers' rights; and collectively bargain, without retribution.	Besides the conditions for employees of the farm, it is assessed, that when buying farm inputs, the farm also considers that all employees and their relatives on all levels of the supply chain enjoy adequate working rights and freedoms.

Dimension	Theme	Sub-Theme	Sub-Theme Objective	Explanation Sub-Theme Objective
	Equity	Non Discrimination	A strict equity and non-discrimination policy is pursued towards all stakeholders; non-discrimination and equal opportunities are explicitly mentioned in enterprise hiring policies, employee or personnel policies (whether written or verbal or code of conduct) and adequate means for implementation and evaluation are in place.	Besides the conditions for employees of the farm, it is assessed, that when buying production means, the farm also considers that on all levels of the supply chain, equity and non-discrimination policies are taken into account.
		Gender Equality	There is no gender disparity concerning hiring, remuneration, access to resources, education and career opportunities.	Besides the conditions for employees of the farm, it is assessed, that when buying production means, the farm also considers that on all levels of the supply chain, gender equality is taken into account.
		Support to Vulnerable People	Vulnerable groups, such as young or elderly employees, women, the disabled, minorities and socially disadvantaged are proactively supported.	Besides the conditions for employees of the farm, it is assessed, that when buying production means, the farm also considers that on all levels of the supply chain, disadvantaged groups are promoted and supported.
	Human Safety & Health	Workplace Safety and Health Provisions	The enterprise ensures that the workplace is safe, has met all appropriate regulations, and caters to the satisfaction of human needs in the provision of sanitary facilities, safe and ergonomic work environment, clean water, healthy food, and clean accommodation (if offered).	

Dimension	Theme	Sub-Theme	Sub-Theme Objective	Explanation Sub-Theme Objective
		Public Health	The enterprise ensures that operations and business activities do not limit the healthy and safe lifestyles of the local community and contributes to community health resources and services.	
	Cultural Diversity	Indigenous Knowledge	Intellectual property rights related to traditional and cultural knowledge are protected and recognized.	It is assessed, whether under the direct influence of the farm and when buying farm inputs on all levels of the supply chain traditional and cultural knowledge is recognized and protected and not endangered through e.g. patents on genetically modified seeds.
		Food Sovereignty	The enterprise contributes to, and benefits from, exercising the right to choice and ownership of their production means, specifically in the preservation and use of traditional, heirloom and locally adapted varieties or breeds.	It is assessed, whether under the direct influence of the farm and when buying farm inputs on all levels of the supply chain freedom of choice and ownership in regards to production means can be exercised and are not endangered through e.g. patents on genetically modified seeds.

SMART-Farm Tool Indicator list

Below, you find the list of indicators that are used in the SMART-Farm Tool. The list is sorted by sub-theme according to the FAO SAFA Guidelines. Since, indicators can have several impacts on different sub-themes, some indicators are repeated in different sub-themes. In the column Indicator name (Relevance), a short title for each indicator and its relevance for different production systems is specified. In the column “Indicator description” the auditor questions are listed. Auditor questions describe the information that a SMART Auditor needs to collect during a farm visit and thus describe the indicator in more detail. Further metadata such as guidelines for data collection (i.e. what to ask the farmer and how to get the information that is relevant for the auditor question?) rating scales (i.e. what state of the indicator results in which performance”) and guidelines and definitions for the evaluation of each indicator are not listed here due to the great space they would require. Further information about the SMART-Farm Tool can be found at www.fibl.org/en/themes/SMART.

Tab. S2 SMART Indicators for the Sub-Theme “Mission Statement”

Indicator number	Indicator name (Relevance)	Indicator description
6	<p>Written commitment to sustainability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Has the farm committed itself in writing to the principles of sustainable development?
7	<p>Publication of written commitment to sustainability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If a written commitment exists:</i></p> <p>Is this commitment available to the public?</p> <p><i>Look at website, if available</i></p>
8	<p>Verbal commitment to sustainability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If no written commitment exists:</i></p> <p>Is the farm manager committed to the principles of sustainability?</p>

Indicator number	Indicator name (Relevance)	Indicator description
35	<p>Sustainability report (based on SAFA)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Has the farm produced or commissioned a sustainability report that covers all dimensions of sustainability?
756	<p>Sustainability report publicly available</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<i>In case a sustainability report is available:</i> Is the sustainability report publicly available ?
20	<p>Explicit sustainability plan</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Does the farm have a specific (written), publicly available plan defining future improvements to improve its sustainability performance?
750	<p>Oral information sustainability improvements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<i>In case no written sustainability plan is available:</i> Is the farm manager able to describe planned sustainability improvements in detail? <i>This includes also improvements on the level of a producer association in case the farm is a member</i>
454	<p>Commitment against discrimination</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<i>Only for large farms:</i> Has the farm committed itself with a written document to prevent discrimination against women, minorities and vulnerable groups?

Indicator number	Indicator name (Relevance)	Indicator description
9	<p>Consideration of external environmental and social costs in the accounting procedure</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm consider the external environmental and social costs and benefits in its accounting?</p> <p><i>Example: according to the concepts of Corporate Social Responsibility and 'triple bottom line' reporting as with the Global Reporting Initiative</i></p>

Tab. S3 SMART Indicators for the Sub-Theme "Due Diligence"

Indicator number	Indicator name (Relevance)	Indicator description
789	<p>On farm mechanization grade</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>To what extent is the physical workload on the farm reduced due to the degree of mechanization?</p>
301	<p>Contamination tests before using bought-in fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>Only in cases, in which external organic fertilizers are applied (e.g. compost, sewage, sludge):</i></p> <p>Are only substances applied (e.g. composts, sewage sludge, wastewater) that have been tested for contamination beforehand (primarily heavy metals, antibiotics) and found to be safe?</p> <p><i>Rate positive if fertilizers from other organic farms are applied.</i></p>
748	<p>Humus Formation: Humus balance</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	<p>1) Is the humus balance calculated?</p> <p>2) Is the humus balance positive, balanced or negative on average? <i>In case of small farms, check whether the farmer focuses on practices that improve humus balance</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
290	<p>Determining fertilizer requirements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When determining fertilizer requirements, are soil analysis results and/or leaf-analysis considered?</p> <p><i>Soil analyses: Once every 5 years: pH, P and K /</i></p> <p><i>Annually: Nmin</i></p>
295	<p>Antibiotics from livestock in fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that manure/slurry from livestock treated with antibiotics is applied to the agricultural area?</p>
710	<p>Harmful substances P-fertilisers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm only use mineral P-fertilisers, which comply with the limits of harmful substances (heavy metals and uranium)?</p>
474,1	<p>Pesticides: Persistence water</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered very persistent in water (half-life > 60 days) according to the "PAN Pesticide Database"?</p>
474,2	<p>Pesticides: Persistence soil</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered to be very persistent in soil (half-life > 180 days) according to the "PAN Pesticide Database"?</p>
474,3	<p>Pesticides: Knowledge about active substances</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are the active substances and the risks associated to their use known to the farm manager?</p>

Indicator number	Indicator name (Relevance)	Indicator description
192	<p>Plants for energy production instead of human consumption</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If a farm uses plant materials for energy production:</i> What part of the substrate used for energy production would also be suitable for human consumption?</p>
34,2	<p>Use of chem. synth. seed dressings</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm refuse to use seeds dressed with synthetic chemicals?</p>
519	<p>Use of GMO-crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Is there a risk that GMO crops are grown at the farm?</p>
34	<p>Use of GMO-feedstuff</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that the farm is using GMO feedstuff?</p>
34,1	<p>Use of nanotechnology-based products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that nanotechnology products are used on the farm?</p>

Indicator number	Indicator name (Relevance)	Indicator description
6	<p>Written commitment to sustainability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Has the farm committed itself in writing to the principles of sustainable development?</p>
7	<p>Publication of written commitment to sustainability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If a written commitment exists:</i></p> <p>Is this commitment available to the public? <i>Look at website, if available</i></p>
8	<p>Verbal commitment to sustainability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If no written commitment exists:</i></p> <p>Is the farm manager committed to the principles of sustainability?</p>
31	<p>Communication with stakeholder groups</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>In the case of decisions that could have negative environmental and/or social impacts:</i></p> <p>Does the farm communicate these risks to stakeholder groups affected?</p>
21	<p>Negative social/environmental impacts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Have there been any incidents in the last 5 years in which the farm has been responsible for negative social or environmental impacts?</p>

Indicator number	Indicator name (Relevance)	Indicator description
67	<p>Prevention of resource conflicts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have mechanisms for preventing the use of resources that have been, or are, legally disputed, or whose ownership is unclear (water, land, biodiversity, etc.)?</p> <p><i>E.g. use a movable fence to avoid grazing conflicts or involvement of concerned stakeholders to commonly set basic rules for the use of water.</i></p>
4	<p>Environmental responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they have an environmental certificate?</p> <p><i>Inputs to consider: Feedstuffs, Mineral fertilisers, organic fertilisers (if bought in).</i></p> <p><i>Assess based on the labels (e.g. organic label).</i></p>
5	<p>Social responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they meet social standards / certificates?</p> <p><i>Inputs to consider: Feedstuffs, Mineral fertilisers, Organic fertilisers (if bought in)</i></p> <p><i>Assess based on the labels.</i></p> <p><i>Possible certifications/labels: Round Table on Responsible Soy (RTRS) and Pro Terra.</i></p>
736	<p>Peat: Origin</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>Is there a risk that the peat used on the farm comes from proclaimed nature conservation areas or is of doubtful origin?</p> <p><i>If the peat is environmentally certified, answer no (labels: RPP, Veriflora).</i></p>
505	<p>Recognition / payment for traditional or indigenous knowledge</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that the farm uses methods / resources (in particular if they are based on patents), which originate from traditional knowledge of people / population groups that have not been compensated for the commercial use of this traditional knowledge?</p> <p><i>Example: As a precautionary principle, the farmer does not use patented seeds.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
170	<p>Food safety standard</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture, Tropical crops</p>	<p>Does the farm comply with any voluntary standard, on top of legal requirements, covering food safety? <i>Examples: GlobalGap, IFS, etc.</i></p>
169	<p>Cases of contamination: Measures</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If contaminated products have left the farm:</i> Have steps been taken to prevent this in future?</p> <p><i>If no contaminated products have left the farm:</i> Are there measures to prevent contaminated products from leaving the farm?</p> <p><i>Do not ask about the following aspects as they are covered by other indicators: antibiotics, cell counts for milk</i></p>
63	<p>Proportion of environmentally certified products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of sales products is certified to carry an ecolabel? <i>All environmental labels are valid that are recommended from WWF (2010):</i> http://assets.wwf.ch/downloads/hintergrundbericht_labelratgeber_2010_def_low.pdf.</p>
65	<p>Proportion of products meeting social standards</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of sold products is certified to carry a social label? All social labels are valid that are recommended from WWF (2010): http://assets.wwf.ch/downloads/hintergrundbericht_labelratgeber_2010_def_low.pdf.</p>
791	<p>Household food security</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do all members of the farm household have adequate nutritional meals each day?</p>

Indicator number	Indicator name (Relevance)	Indicator description
455	<p>Anti-discrimination measures</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm take measures to prevent discrimination against women, minorities and vulnerable groups?</p> <p><i>Example: Contracts for all employees are based on a clear defined set of rules.</i></p>
460	<p>Proactive support of disadvantaged groups</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does this operation provide extra support to disadvantaged groups (women, minorities, disabled people, etc.)?</p> <p><i>Give specific examples: Financially support to women during their maternity leave, paying for the language courses of non-native speakers etc.</i></p>
454	<p>Commitment against discrimination</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>Only for large farms:</i></p> <p>Has the farm committed itself with a written document to prevent discrimination against women, minorities and vulnerable groups?</p>
464	<p>Systematic identification of potential safety hazards</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>For smallholders and family farms:</i></p> <p>Is the farm manager aware of all relevant potential safety hazards?</p> <p><i>For large operations:</i></p> <p>Are safety hazards systematically identified and recorded?</p>
790	<p>Employees: Use of protective gear</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Bees, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farmer ensure that workers have appropriate protection during their application of pesticides and other hazardous materials?</p>

Indicator number	Indicator name (Relevance)	Indicator description
470	<p>Certification for the use of plant protection and animal treatment products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the farm certified to use plant protection and animal treatment products (e.g., EUREPGAP or similar certification, training by the extension service)?</p> <p><i>In the case that only one expertise is needed and fulfilled: Rate "yes".</i></p>

Tab. S4 SMART Indicators for the Sub-Theme "Holistic Audits"

Indicator number	Indicator name (Relevance)	Indicator description
748	<p>Humus Formation: Humus balance</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	<p>1) Is the humus balance calculated?</p> <p>2) Is the humus balance positive, balanced or negative on average? <i>In case of small farms, check whether the farmer focuses on practices that improve humus balance</i></p>
290	<p>Determining fertilizer requirements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When determining fertilizer requirements, are soil analysis results and/or leaf-analysis considered?</p> <p><i>Soil analyses: Once every 5 years: pH, P and K / Annually: Nmin</i></p>
322	<p>Mineral K fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is mineral Potassium fertilizer used in a needs-oriented way on the farm's agricultural area?</p> <p><i>Rate "needs-oriented" if Potassium fertilizer isn't applied with good reason and if there is at the same time no Potassium deficiency.</i></p>
375	<p>Animal welfare standards slaughter</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Does the farm manager know the welfare standards of the slaughterhouse?</p> <p><i>Score based on worst animal category. If farmer is not familiar with the welfare standards, rate as negative</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
6	<p>Written commitment to sustainability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Has the farm committed itself in writing to the principles of sustainable development?
7	<p>Publication of written commitment to sustainability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If a written commitment exists:</i></p> <p>Is this commitment available to the public?</p> <p><i>Look at website, if available</i></p>
35	<p>Sustainability report (based on SAFA)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Has the farm produced or commissioned a sustainability report that covers all dimensions of sustainability?
756	<p>Sustainability report publicly available</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>In case a sustainability report is available:</i></p> <p>Is the sustainability report publicly available?</p>
20	<p>Explicit sustainability plan</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Does the farm have a specific (written), publicly available plan defining future improvements to improve its sustainability performance?

Indicator number	Indicator name (Relevance)	Indicator description
750	<p>Oral information sustainability improvements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>In case no written sustainability plan is available:</i></p> <p>Is the farm manager able to describe planned sustainability improvements in detail?</p> <p><i>This includes also improvements on the level of a producer association in case the farm is a member</i></p>
4	<p>Environmental responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they have an environmental certificate?</p> <p><i>Inputs to consider: Feedstuffs, Mineral fertilisers, organic fertilisers (if bought in).</i></p> <p><i>Assess based on the labels (e.g. organic label).</i></p>
5	<p>Social responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they meet social standards / certificates?</p> <p><i>Inputs to consider: Feedstuffs, Mineral fertilisers, Organic fertilisers (if bought in)</i></p> <p><i>Assess based on the labels.</i></p> <p><i>Possible certifications/labels: Round Table on Responsible Soy (RTRS) and Pro Terra.</i></p>
170	<p>Food safety standard</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture, Tropical crops</p>	<p>Does the farm comply with any voluntary standard, on top of legal requirements, covering food safety?</p> <p><i>Examples: GlobalGap, IFS, etc.</i></p>
63	<p>Proportion of environmentally certified products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of sales products is certified to carry an ecolabel?</p> <p><i>All environmental labels are valid that are recommended from WWF (2010):</i></p> <p><i>http://assets.wwf.ch/downloads/hintergrundbericht_1_abelratgeber_2010_def_low.pdf.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
65	<p>Proportion of products meeting social standards</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of sold products is certified to carry a social label? All social labels are valid that are recommended from WWF (2010): http://assets.wwf.ch/downloads/hintergrundbericht_labelratgeber_2010_def_low.pdf.</p>
469	<p>Management system for workplace safety and health</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a professional management system for workplace safety and health in place to reduce the risk of injuries and illnesses relating to work?</p>
0	<p>Professional agricultural accounts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have a professional agricultural accounting procedure that is also used for the farm management?</p> <p><i>Rate "partly" if the professional accounts are not used for the farm management.</i></p>
9	<p>Consideration of external environmental and social costs in the accounting procedure</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm consider the external environmental and social costs and benefits in its accounting?</p> <p><i>Example: according to the concepts of Corporate Social Responsibility and 'triple bottom line' reporting as with the Global Reporting Initiative</i></p>

Tab. S5 SMART Indicators for the Sub-Theme "Responsibility"

Indicator number	Indicator name (Relevance)	Indicator description
6	<p>Written commitment to sustainability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Has the farm committed itself in writing to the principles of sustainable development?
7	<p>Publication of written commitment to sustainability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If a written commitment exists:</i></p> <p>Is this commitment available to the public?</p> <p><i>Look at website, if available</i></p>
8	<p>Verbal commitment to sustainability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If no written commitment exists:</i></p> <p>Is the farm manager committed to the principles of sustainability?</p>
35	<p>Sustainability report (based on SAFA)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Has the farm produced or commissioned a sustainability report that covers all dimensions of sustainability?
756	<p>Sustainability report publicly available</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>In case a sustainability report is available:</i></p> <p>Is the sustainability report publicly available?</p>

Indicator number	Indicator name (Relevance)	Indicator description
20	<p>Explicit sustainability plan</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have a specific (written), publicly available plan defining future improvements to improve its sustainability performance?</p>
750	<p>Oral information sustainability improvements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>In case no written sustainability plan is available:</i></p> <p>Is the farm manager able to describe planned sustainability improvements in detail?</p> <p><i>This includes also improvements on the level of a producer association in case the farm is a member</i></p>
57	<p>Involvement in improving laws and regulations</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm support or take part in political or social activities for improving sustainability (in the social and/or environmental spheres) on the level of regulations (laws)?</p> <p><i>Only providing financial support is not enough for a positive rating.</i></p>
31	<p>Communication with stakeholder groups</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>In the case of decisions that could have negative environmental and/or social impacts:</i></p> <p>Does the farm communicate these risks to stakeholder groups affected?</p>
21	<p>Negative social/environmental impacts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Have there been any incidents in the last 5 years in which the farm has been responsible for negative social or environmental impacts?</p>

Indicator number	Indicator name (Relevance)	Indicator description
28	<p>Fair resolution of conflicts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If there have been resolved environmental and/or social conflicts:</i></p> <p>Were these resolved in an atmosphere of respect, mutual understanding and fairness?</p>
4	<p>Environmental responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they have an environmental certificate?</p> <p><i>Inputs to consider: Feedstuffs, Mineral fertilisers, organic fertilisers (if bought in).</i></p> <p><i>Assess based on the labels (e.g. organic label).</i></p>
5	<p>Social responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they meet social standards / certificates?</p> <p><i>Inputs to consider: Feedstuffs, Mineral fertilisers, Organic fertilisers (if bought in)</i></p> <p><i>Assess based on the labels.</i></p> <p><i>Possible certifications/labels: Round Table on Responsible Soy (RTRS) and Pro Terra.</i></p>
74	<p>Environmental involvement outside the farm: Costs</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the farm involved in environmental protection (not paid for), besides its own land? If yes, how many days per year are taken for such projects?</p>
75	<p>Social involvement outside the farm: Costs</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the farm involved in social matters (not paid for) in the community? If yes, how many days on average per year are taken for this commitment?</p>

Indicator number	Indicator name (Relevance)	Indicator description
9	<p>Consideration of external environmental and social costs in the accounting procedure</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm consider the external environmental and social costs and benefits in its accounting?</p> <p><i>Example: according to the concepts of Corporate Social Responsibility and 'triple bottom line' reporting as with the Global Reporting Initiative</i></p>
70	<p>Cooperation with ethical financial institutions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm cooperate with ethical banks?</p> <p><i>E.g. Alternative Bank (CH), GLS (DE); do not rate if there is no cooperation with a bank.</i></p>

Tab. S6 SMART Indicators for the Sub-Theme "Transparency"

Indicator number	Indicator name (Relevance)	Indicator description
6	<p>Written commitment to sustainability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Has the farm committed itself in writing to the principles of sustainable development?</p>
7	<p>Publication of written commitment to sustainability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If a written commitment exists:</i></p> <p>Is this commitment available to the public?</p> <p><i>Look at website, if available</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
8	<p>Verbal commitment to sustainability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If no written commitment exists:</i></p> <p>Is the farm manager committed to the principles of sustainability?</p>
35	<p>Sustainability report (based on SAFA)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Has the farm produced or commissioned a sustainability report that covers all dimensions of sustainability?</p>
756	<p>Sustainability report publicly available</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>In case a sustainability report is available:</i></p> <p>Is the sustainability report publicly available?</p>
20	<p>Explicit sustainability plan</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have a specific (written), publicly available plan defining future improvements to improve its sustainability performance?</p>
750	<p>Oral information sustainability improvements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>In case no written sustainability plan is available:</i></p> <p>Is the farm manager able to describe planned sustainability improvements in detail?</p> <p><i>This includes also improvements on the level of a producer association in case the farm is a member</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
31	<p>Communication with stakeholder groups</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>In the case of decisions that could have negative environmental and/or social impacts:</i></p> <p>Does the farm communicate these risks to stakeholder groups affected?</p>
165	<p>Traceability of bought-in farm inputs</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the origin of the externally sourced inputs traceable back to their source?</p> <p><i>Ask separately for the most important farm inputs. This refers to the original source of the inputs, not the point of sale.</i></p>
170	<p>Food safety standard</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture, Tropical crops</p>	<p>Does the farm comply with any voluntary standard, on top of legal requirements, covering food safety?</p> <p><i>Examples: GlobalGap, IFS, etc.</i></p>
63	<p>Proportion of environmentally certified products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of sales products is certified to carry an ecolabel?</p> <p><i>All environmental labels are valid that are recommended from WWF (2010):</i></p> <p><i>http://assets.wwf.ch/downloads/hintergrundbericht_labelratgeber_2010_def_low.pdf.</i></p>
65	<p>Proportion of products meeting social standards</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of sold products is certified to carry a social label? All social labels are valid that are recommended from WWF (2010):</p> <p><i>http://assets.wwf.ch/downloads/hintergrundbericht_labelratgeber_2010_def_low.pdf.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
175	<p>Transparency of production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are details of production methods at the farm transparent and available to buyers?</p> <p><i>E.g. through participation in programmes such as “www.Bio-mit-Gesicht.de” (products are traceable through numbers for the consumer). In the case of direct sales, check the website for information on the production (inputs, practices, labels etc.).</i></p>
470	<p>Certification for the use of plant protection and animal treatment products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the farm certified to use plant protection and animal treatment products (e.g., EUREPGAP or similar certification, training by the extension service)?</p> <p><i>In the case that only one expertise is needed and fulfilled: Rate "yes".</i></p>
469	<p>Management system for workplace safety and health</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a professional management system for workplace safety and health in place to reduce the risk of injuries and illnesses relating to work?</p>
9	<p>Consideration of external environmental and social costs in the accounting procedure</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm consider the external environmental and social costs and benefits in its accounting?</p> <p><i>Example: according to the concepts of Corporate Social Responsibility and ‘triple bottom line’ reporting as with the Global Reporting Initiative</i></p>
70	<p>Cooperation with ethical financial institutions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm cooperate with ethical banks?</p> <p><i>E.g. Alternative Bank (CH), GLS (DE); do not rate if there is no cooperation with a bank.</i></p>

Tab. S7 SMART Indicators for the Sub-Theme “Stakeholder Dialogue”

Indicator number	Indicator name (Relevance)	Indicator description
57	<p>Involvement in improving laws and regulations</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm support or take part in political or social activities for improving sustainability (in the social and/or environmental spheres) on the level of regulations (laws)?</p> <p><i>Only providing financial support is not enough for a positive rating.</i></p>
31	<p>Communication with stakeholder groups</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>In the case of decisions that could have negative environmental and/or social impacts:</i></p> <p>Does the farm communicate these risks to stakeholder groups affected?</p>
22	<p>Successful conflict resolution (social/environmental)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If the farm has been involved in incidents with negative environmental / social impacts:</i></p> <p>Did they result in conflicts with stakeholders (employees, residents or environmental groups etc.) that have not been resolved?</p>
28	<p>Fair resolution of conflicts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If there have been resolved environmental and/or social conflicts:</i></p> <p>Were these resolved in an atmosphere of respect, mutual understanding and fairness?</p>
403	<p>Conflicts over water quantity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are there, or have there been, any conflicts with other water users / stakeholders in the farm’s neighbourhood over access to water and the volume of water used?</p>

Indicator number	Indicator name (Relevance)	Indicator description
402	<p>Conflicts over water quality</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are there, or have there been, any conflicts with other water users / stakeholders over water quality in the farm's neighbourhood?</p>
627	<p>Cooperation with other farms</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm successfully, and in the long term, cooperate with other farms? <i>Exclude cooperation in marketing (indicator 768).</i></p>
67	<p>Prevention of resource conflicts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have mechanisms for preventing the use of resources that have been, or are, legally disputed, or whose ownership is unclear (water, land, biodiversity, etc.)? <i>E.g. use a movable fence to avoid grazing conflicts or involvement of concerned stakeholders to commonly set basic rules for the use of water.</i></p>
707	<p>Customer relationship</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture</p>	<p>Does the farm cooperate with customers / buyers? Examples: Common product development, production planning, advisory service from the buyer, etc.</p>
442	<p>Employees: Freedom of assembly and collective bargaining rights</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are employees free to assemble and engage in (collective) bargaining?</p>

Indicator number	Indicator name (Relevance)	Indicator description
442,1	<p>Employees: Freedom of joining unions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Are employees free to join unions?
460	<p>Proactive support of disadvantaged groups</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does this operation provide extra support to disadvantaged groups (women, minorities, disabled people, etc.)?</p> <p><i>Give specific examples: Financially support to women during their maternity leave, paying for the language courses of non-native speakers etc.</i></p>
469	<p>Management system for workplace safety and health</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is there a professional management system for workplace safety and health in place to reduce the risk of injuries and illnesses relating to work?
153	<p>Problems with loan providers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	In the last 5 years, have there been problems with lenders?
70	<p>Cooperation with ethical financial institutions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm cooperate with ethical banks?</p> <p><i>E.g. Alternative Bank (CH), GLS (DE); do not rate if there is no cooperation with a bank.</i></p>

Tab. S8 SMART Indicators for the Sub-Theme “Grievance Procedures”

Indicator number	Indicator name (Relevance)	Indicator description
22	<p>Successful conflict resolution (social/environmental)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If the farm has been involved in incidents with negative environmental / social impacts:</i></p> <p>Did they result in conflicts with stakeholders (employees, residents or environmental groups etc.) that have not been resolved?</p>
28	<p>Fair resolution of conflicts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If there have been resolved environmental and/or social conflicts:</i></p> <p>Were these resolved in an atmosphere of respect, mutual understanding and fairness?</p>
67	<p>Prevention of resource conflicts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have mechanisms for preventing the use of resources that have been, or are, legally disputed, or whose ownership is unclear (water, land, biodiversity, etc.)?</p> <p><i>E.g. use a movable fence to avoid grazing conflicts or involvement of concerned stakeholders to commonly set basic rules for the use of water.</i></p>
65	<p>Proportion of products meeting social standards</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of sold products is certified to carry a social label? All social labels are valid that are recommended from WWF (2010):</p> <p>http://assets.wwf.ch/downloads/hintergrundbericht_labelratgeber_2010_def_low.pdf.</p>
423	<p>Employees: Legally binding contracts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do all of the employees have legally binding employment contracts?</p>

Indicator number	Indicator name (Relevance)	Indicator description
442	<p>Employees: Freedom of assembly and collective bargaining rights</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Are employees free to assemble and engage in (collective) bargaining?
442,1	<p>Employees: Freedom of joining unions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Are employees free to join unions?
460	<p>Proactive support of disadvantaged groups</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does this operation provide extra support to disadvantaged groups (women, minorities, disabled people, etc.)?</p> <p><i>Give specific examples: Financially support to women during their maternity leave, paying for the language courses of non-native speakers etc.</i></p>
454	<p>Commitment against discrimination</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>Only for large farms:</i></p> <p>Has the farm committed itself with a written document to prevent discrimination against women, minorities and vulnerable groups?</p>
75	<p>Social involvement outside the farm: Costs</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is the farm involved in social matters (not paid for) in the community? If yes, how many days on average per year are taken for this commitment?

Tab. S9 SMART Indicators for the Sub-Theme “Conflict Resolution”

Indicator number	Indicator name (Relevance)	Indicator description
31	<p>Communication with stakeholder groups</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>In the case of decisions that could have negative environmental and/or social impacts:</i></p> <p>Does the farm communicate these risks to stakeholder groups affected?</p>
21	<p>Negative social/environmental impacts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Have there been any incidents in the last 5 years in which the farm has been responsible for negative social or environmental impacts?</p>
22	<p>Successful conflict resolution (social/environmental)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If the farm has been involved in incidents with negative environmental / social impacts:</i></p> <p>Did they result in conflicts with stakeholders (employees, residents or environmental groups etc.) that have not been resolved?</p>
28	<p>Fair resolution of conflicts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If there have been resolved environmental and/or social conflicts:</i></p> <p>Were these resolved in an atmosphere of respect, mutual understanding and fairness?</p>
403	<p>Conflicts over water quantity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are there, or have there been, any conflicts with other water users / stakeholders in the farm’s neighbourhood over access to water and the volume of water used?</p>

Indicator number	Indicator name (Relevance)	Indicator description
402	<p>Conflicts over water quality</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are there, or have there been, any conflicts with other water users / stakeholders over water quality in the farm's neighbourhood?</p>
627	<p>Cooperation with other farms</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm successfully, and in the long term, cooperate with other farms? <i>Exclude cooperation in marketing (indicator 768).</i></p>
67	<p>Prevention of resource conflicts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have mechanisms for preventing the use of resources that have been, or are, legally disputed, or whose ownership is unclear (water, land, biodiversity, etc.)? <i>E.g. use a movable fence to avoid grazing conflicts or involvement of concerned stakeholders to commonly set basic rules for the use of water.</i></p>
707	<p>Customer relationship</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture</p>	<p>Does the farm cooperate with customers / buyers? Examples: Common product development, production planning, advisory service from the buyer, etc.</p>
442	<p>Employees: Freedom of assembly and collective bargaining rights</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are employees free to assemble and engage in (collective) bargaining?</p>

Indicator number	Indicator name (Relevance)	Indicator description
442,1	<p>Employees: Freedom of joining unions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Are employees free to join unions?
460	<p>Proactive support of disadvantaged groups</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does this operation provide extra support to disadvantaged groups (women, minorities, disabled people, etc.)?</p> <p><i>Give specific examples: Financially support to women during their maternity leave, paying for the language courses of non-native speakers etc.</i></p>
469	<p>Management system for workplace safety and health</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is there a professional management system for workplace safety and health in place to reduce the risk of injuries and illnesses relating to work?
153	<p>Problems with loan providers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	In the last 5 years, have there been problems with lenders?

Tab. S10 SMART Indicators for the Sub-Theme “Legitimacy”

Indicator number	Indicator name (Relevance)	Indicator description
178	<p>Waiting period between animal manure and harvest</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are the waiting periods between the last application of animal manure and the product harvest adequate? <i>Look up the legal provisions before or after the interview.</i></p>
474,3	<p>Pesticides: Knowledge about active substances</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are the active substances and the risks associated to their use known to the farm manager?</p>
765	<p>Correct waste disposal</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is all operational/commercial waste disposed correctly? Exclude pesticides and veterinary medicines (already covered in ID 327) Consider waste e.g.: <i>Waste oil, used tyres, batteries, plastics, metal, paper/cardboard, glass and other waste</i> <i>Comment: score positive if waste is collected by public/private services (for e.g. incineration, covered land-fill)</i></p>
327	<p>Waste disposal: pesticides and veterinary medicines</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are all waste materials from plant protection products and veterinary medicines disposed properly? <i>Score positive if no such wastes arise</i></p>
331	<p>Waste disposal: cadaver livestock</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Are all animal wastes/cadavers disposed properly (not harm human to health and environment)? <i>Score positive if no such wastes arise</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
21	<p>Negative social/environmental impacts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Have there been any incidents in the last 5 years in which the farm has been responsible for negative social or environmental impacts?</p>
53	<p>Infringements of the law</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>In the last 5 years, have there been any cases in which the farm has broken the law? If yes, how serious were they?</p>
67	<p>Prevention of resource conflicts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have mechanisms for preventing the use of resources that have been, or are, legally disputed, or whose ownership is unclear (water, land, biodiversity, etc.)?</p> <p><i>E.g. use a movable fence to avoid grazing conflicts or involvement of concerned stakeholders to commonly set basic rules for the use of water.</i></p>
4	<p>Environmental responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they have an environmental certificate?</p> <p><i>Inputs to consider: Feedstuffs, Mineral fertilisers, organic fertilisers (if bought in).</i></p> <p><i>Assess based on the labels (e.g. organic label).</i></p>
5	<p>Social responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they meet social standards / certificates?</p> <p><i>Inputs to consider: Feedstuffs, Mineral fertilisers, Organic fertilisers (if bought in)</i></p> <p><i>Assess based on the labels.</i></p> <p><i>Possible certifications/labels: Round Table on Responsible Soy (RTRS) and Pro Terra.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
170	<p>Food safety standard</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture, Tropical crops</p>	<p>Does the farm comply with any voluntary standard, on top of legal requirements, covering food safety?</p> <p><i>Examples: GlobalGap, IFS, etc.</i></p>
167	<p>Contaminated products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Have any contaminated products returned to the farm in the last 5 years that posed a risk for food safety?</p>
423	<p>Employees: Legally binding contracts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do all of the employees have legally binding employment contracts?</p>
118	<p>Employees: Work permits</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture</p>	<p>Do all employees have work permits and are they registered with the authorities?</p>
410	<p>Relationship paid salary to regional, sector-specific minimum salary</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How does the minimum wage that the operation pays to its employees compares with the statutory minimum wage that is generally paid in this region and sector?</p> <p><i>Except apprentices.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
513	<p>Dispossession of smallholders / local communities</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is there a risk that smallholders or local communities were dispossessed (without adequate compensation) in order to establish this farm?

Tab. S11 SMART Indicators for the Sub-Theme “Remedy, Restoration & Prevention”

Indicator number	Indicator name (Relevance)	Indicator description
35	<p>Sustainability report (based on SAFA)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Has the farm produced or commissioned a sustainability report that covers all dimensions of sustainability?
756	<p>Sustainability report publicly available</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<i>In case a sustainability report is available:</i> Is the sustainability report publicly available?
750	<p>Oral information sustainability improvements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<i>In case no written sustainability plan is available:</i> Is the farm manager able to describe planned sustainability improvements in detail? <i>This includes also improvements on the level of a producer association in case the farm is a member</i>

Indicator number	Indicator name (Relevance)	Indicator description
21	<p>Negative social/environmental impacts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Have there been any incidents in the last 5 years in which the farm has been responsible for negative social or environmental impacts?</p>
22	<p>Successful conflict resolution (social/environmental)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If the farm has been involved in incidents with negative environmental / social impacts:</i></p> <p>Did they result in conflicts with stakeholders (employees, residents or environmental groups etc.) that have not been resolved?</p>
28	<p>Fair resolution of conflicts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If there have been resolved environmental and/or social conflicts:</i></p> <p>Were these resolved in an atmosphere of respect, mutual understanding and fairness?</p>
53	<p>Infringements of the law</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>In the last 5 years, have there been any cases in which the farm has broken the law? If yes, how serious were they?</p>
67	<p>Prevention of resource conflicts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have mechanisms for preventing the use of resources that have been, or are, legally disputed, or whose ownership is unclear (water, land, biodiversity, etc.)?</p> <p><i>E.g. use a movable fence to avoid grazing conflicts or involvement of concerned stakeholders to commonly set basic rules for the use of water.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
169	<p>Cases of contamination: Measures</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If contaminated products have left the farm:</i> Have steps been taken to prevent this in future?</p> <p><i>If no contaminated products have left the farm:</i> Are there measures to prevent contaminated products from leaving the farm?</p> <p><i>Do not ask about the following aspects as they are covered by other indicators: antibiotics, cell counts for milk</i></p>
513	<p>Dispossession of smallholders / local communities</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is there a risk that smallholders or local communities were dispossessed (without adequate compensation) in order to establish this farm?

Tab. S12 SMART Indicators for the Sub-Theme “Civic Responsibility”

Indicator number	Indicator name (Relevance)	Indicator description
57	<p>Involvement in improving laws and regulations</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm support or take part in political or social activities for improving sustainability (in the social and/or environmental spheres) on the level of regulations (laws)?</p> <p><i>Only providing financial support is not enough for a positive rating.</i></p>
4	<p>Environmental responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they have an environmental certificate?</p> <p><i>Inputs to consider: Feedstuffs, Mineral fertilisers, organic fertilisers (if bought in).</i></p> <p><i>Assess based on the labels (e.g. organic label).</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
5	<p>Social responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they meet social standards / certificates?</p> <p><i>Inputs to consider: Feedstuffs, Mineral fertilisers, Organic fertilisers (if bought in)</i></p> <p><i>Assess based on the labels.</i></p> <p><i>Possible certifications/labels: Round Table on Responsible Soy (RTRS) and Pro Terra.</i></p>
74	<p>Environmental involvement outside the farm: Costs</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the farm involved in environmental protection (not paid for), besides its own land? If yes, how many days per year are taken for such projects?</p>
75	<p>Social involvement outside the farm: Costs</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the farm involved in social matters (not paid for) in the community? If yes, how many days on average per year are taken for this commitment?</p>
506	<p>Food security measures for local communities</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Aquaculture, Tropical crops</p>	<p>Does the farm take steps / implement projects to enhance the food security of the local community, or does it financially support such efforts?</p> <p><i>Examples: Teach other farmers how to store or to further process raw products.</i></p>
70	<p>Cooperation with ethical financial institutions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm cooperate with ethical banks?</p> <p><i>E.g. Alternative Bank (CH), GLS (DE); do not rate if there is no cooperation with a bank.</i></p>

Tab. S13 SMART Indicators for the Sub-Theme “Resource Appropriation”

Indicator number	Indicator name (Relevance)	Indicator description
376,1	<p>Information on water availability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>In case there is a risk of temporary water scarcity, does the farm have access to information on water availability (e.g. groundwater level)?</p>
31	<p>Communication with stakeholder groups</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>In the case of decisions that could have negative environmental and/or social impacts:</i></p> <p>Does the farm communicate these risks to stakeholder groups affected?</p>
21	<p>Negative social/environmental impacts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Have there been any incidents in the last 5 years in which the farm has been responsible for negative social or environmental impacts?</p>
22	<p>Successful conflict resolution (social/environmental)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If the farm has been involved in incidents with negative environmental / social impacts:</i></p> <p>Did they result in conflicts with stakeholders (employees, residents or environmental groups etc.) that have not been resolved?</p>
403	<p>Conflicts over water quantity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are there, or have there been, any conflicts with other water users / stakeholders in the farm’s neighbourhood over access to water and the volume of water used?</p>

Indicator number	Indicator name (Relevance)	Indicator description
402	<p>Conflicts over water quality</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are there, or have there been, any conflicts with other water users / stakeholders over water quality in the farm's neighbourhood?</p>
67	<p>Prevention of resource conflicts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have mechanisms for preventing the use of resources that have been, or are, legally disputed, or whose ownership is unclear (water, land, biodiversity, etc.)?</p> <p><i>E.g. use a movable fence to avoid grazing conflicts or involvement of concerned stakeholders to commonly set basic rules for the use of water.</i></p>
165	<p>Traceability of bought-in farm inputs</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the origin of the externally sourced inputs traceable back to their source?</p> <p><i>Ask separately for the most important farm inputs. This refers to the original source of the inputs, not the point of sale.</i></p>
5	<p>Social responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they meet social standards / certificates?</p> <p><i>Inputs to consider: Feedstuffs, Mineral fertilisers, Organic fertilisers (if bought in)</i></p> <p><i>Assess based on the labels.</i></p> <p><i>Possible certifications/labels: Round Table on Responsible Soy (RTRS) and Pro Terra.</i></p>
514	<p>Farm inputs from countries with problematic social conditions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that farm inputs originate from countries with problematic social conditions and don't have a social certification?</p> <p><i>(Problematic regions according to ILO: Middle East, Africa, Latin America, Caribbean, Asia and the Pacific; for individual countries refer to BSCI-rating).</i></p> <p><i>If no, can information regarding the social compatibility of their production be furnished? (This relates to where the farm inputs originally came from.)</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
505	<p>Recognition / payment for traditional or indigenous knowledge</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that the farm uses methods / resources (in particular if they are based on patents), which originate from traditional knowledge of people / population groups that have not been compensated for the commercial use of this traditional knowledge?</p> <p><i>Example: As a precautionary principle, the farmer does not use patented seeds.</i></p>
65	<p>Proportion of products meeting social standards</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of sold products is certified to carry a social label? All social labels are valid that are recommended from WWF (2010):</p> <p>http://assets.wwf.ch/downloads/hintergrundbericht_labelratgeber_2010_def_low.pdf.</p>
410	<p>Relationship paid salary to regional, sector-specific minimum salary</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How does the minimum wage that the operation pays to its employees compares with the statutory minimum wage that is generally paid in this region and sector?</p> <p><i>Except apprentices.</i></p>
513	<p>Dispossession of smallholders / local communities</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that smallholders or local communities were dispossessed (without adequate compensation) in order to establish this farm?</p>
70	<p>Cooperation with ethical financial institutions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm cooperate with ethical banks?</p> <p><i>E.g. Alternative Bank (CH), GLS (DE); do not rate if there is no cooperation with a bank.</i></p>

Tab. S14 SMART Indicators for the Sub-Theme “Sustainability Management Plan”

Indicator number	Indicator name (Relevance)	Indicator description
100	<p>Market challenges</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is the farmer aware and informed about future market challenges?
101	<p>Political / Policy challenges</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is the farmer aware and informed about future policy changes / political challenges?
134	<p>Knowledge of climate change problems</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Does the farm manager know the predictions for climate changes in the region resulting from global climate change and can he judge the impact on the farm?
136	<p>Climate change adaptation measures</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>Only score if there are negative climate-related predictions:</i></p> <p>Is the farm taking steps to adapt to the consequences of climate change?</p>
6	<p>Written commitment to sustainability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Has the farm committed itself in writing to the principles of sustainable development?

Indicator number	Indicator name (Relevance)	Indicator description
7	<p>Publication of written commitment to sustainability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If a written commitment exists:</i></p> <p>Is this commitment available to the public?</p> <p><i>Look at website, if available</i></p>
8	<p>Verbal commitment to sustainability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If no written commitment exists:</i></p> <p>Is the farm manager committed to the principles of sustainability?</p>
35	<p>Sustainability report (based on SAFA)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Has the farm produced or commissioned a sustainability report that covers all dimensions of sustainability?</p>
756	<p>Sustainability report publicly available</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>In case a sustainability report is available:</i></p> <p>Is the sustainability report publicly available?</p>
20	<p>Explicit sustainability plan</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have a specific (written), publicly available plan defining future improvements to improve its sustainability performance?</p>

Indicator number	Indicator name (Relevance)	Indicator description
750	<p>Oral information sustainability improvements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>In case no written sustainability plan is available:</i></p> <p>Is the farm manager able to describe planned sustainability improvements in detail?</p> <p><i>This includes also improvements on the level of a producer association in case the farm is a member</i></p>
4	<p>Environmental responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they have an environmental certificate?</p> <p><i>Inputs to consider: Feedstuffs, Mineral fertilisers, organic fertilisers (if bought in).</i></p> <p><i>Assess based on the labels (e.g. organic label).</i></p>
5	<p>Social responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they meet social standards / certificates?</p> <p><i>Inputs to consider: Feedstuffs, Mineral fertilisers, Organic fertilisers (if bought in)</i></p> <p><i>Assess based on the labels.</i></p> <p><i>Possible certifications/labels: Round Table on Responsible Soy (RTRS) and Pro Terra.</i></p>
124	<p>Guaranteed staff replacement: Farm succession</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the farm succession secured?</p> <p><i>Do not ask farm managers below 55 years of age.</i></p>
125	<p>Training on sustainability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If participated in training:</i></p> <p>Have competences/knowledge relating to environmental, social and economic sustainability also been taught?</p>

Indicator number	Indicator name (Relevance)	Indicator description
0	<p>Professional agricultural accounts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have a professional agricultural accounting procedure that is also used for the farm management?</p> <p><i>Rate "partly" if the professional accounts are not used for the farm management.</i></p>

Tab. S15 SMART Indicators for the Sub-Theme "Full-Cost Accounting"

Indicator number	Indicator name (Relevance)	Indicator description
6	<p>Written commitment to sustainability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Has the farm committed itself in writing to the principles of sustainable development?</p>
8	<p>Verbal commitment to sustainability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If no written commitment exists:</i></p> <p>Is the farm manager committed to the principles of sustainability?</p>
35	<p>Sustainability report (based on SAFA)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Has the farm produced or commissioned a sustainability report that covers all dimensions of sustainability?</p>

Indicator number	Indicator name (Relevance)	Indicator description
756	<p>Sustainability report publicly available</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>In case a sustainability report is available:</i></p> <p>Is the sustainability report publicly available?</p>
20	<p>Explicit sustainability plan</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have a specific (written), publicly available plan defining future improvements to improve its sustainability performance?</p>
750	<p>Oral information sustainability improvements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>In case no written sustainability plan is available:</i></p> <p>Is the farm manager able to describe planned sustainability improvements in detail?</p> <p><i>This includes also improvements on the level of a producer association in case the farm is a member</i></p>
0	<p>Professional agricultural accounts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have a professional agricultural accounting procedure that is also used for the farm management?</p> <p><i>Rate "partly" if the professional accounts are not used for the farm management.</i></p>
9	<p>Consideration of external environmental and social costs in the accounting procedure</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm consider the external environmental and social costs and benefits in its accounting?</p> <p><i>Example: according to the concepts of Corporate Social Responsibility and 'triple bottom line' reporting as with the Global Reporting Initiative</i></p>

Tab. S16 SMART Indicators for the Sub-Theme “Greenhouse Gases”

Indicator number	Indicator name (Relevance)	Indicator description
222	<p>Permanent grasslands: Share of agricultural area</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Tropical crops</p>	<p>What proportion of the agricultural area is devoted to permanent grassland?</p>
253	<p>Permanent grasslands: Extensively managed</p> <p>Relevant for farms with the following activities: Arable farming, Permanent grassland, Beef cattle, Pig production, Poultry production, Tropical crops</p>	<p>What proportion of the area of permanent grassland is under extensive management?</p> <p>Extensive means: double mowing/grazing or less, zero application of fertilizers / pesticides</p>
206	<p>Share of legumes on arable land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the arable land is devoted to leguminous crops?</p>
764	<p>Share of legumes on perennial crops area</p> <p>Relevant for farms with the following activities: Fruit production, Viticulture, Tree nursery / perennials</p>	<p>What proportion of the perennial crops area is devoted to legumes?</p>
700	<p>Measures to prevent erosion</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>Are sufficient measures taken on agricultural areas (excluding permanent grassland) with sloping gradients lower than 15 % to prevent erosion?</p> <p><i>Consider: cropping techniques, type of crop, gradients, weather conditions (wind, rainfall etc.).</i></p>
712	<p>Bought-in organic fertilisers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>What proportion of the entire organic fertilisers used is externally sourced?</p> <p><i>In the past 5 years - average per year?</i></p> <p><i>Green manure not counted in calculation</i></p>
199	<p>Bought-in concentrated feed</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>What proportion of the concentrate feed used on the farm is sourced externally?</p>

Indicator number	Indicator name (Relevance)	Indicator description
368	<p>Stocking density</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Are stocking densities in the housing system (animals/m² of floor space) adequate (sufficient space for movements and to avoid animal injuries and stress due to conflicts) for all livestock categories?</p>
720	<p>Silage storage</p> <p>Relevant for farms with the following activities: Permanent grassland, Beef cattle, Pig production, Dairy cattle / Goats / Sheep</p>	<p>Is the silage stored appropriately to minimize losses and avoid contamination?</p>
380	<p>On-farm point sources of nutrients and pollutants</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Can it be excluded that there are direct point source emissions of nutrients and pollutants to the atmosphere and water bodies (incl. wells and drinking water sources) on the farm and its utilized areas? <i>e.g. exports (= emissions through discharge and degas) from exercise yards, farmyard manure stores, livestock water facilities or shelter of animals near to water on pastures, direct entry of animals into the water and cleaning areas.</i></p>
341	<p>Settings of combustion motors</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How often are the settings of combustion motors of vehicles (e.g. tractor, stapler) and other machineries checked and adjusted (engine, air filter etc.)? e.g.: based on exhaust emissions test results If no tractor is use give highest score.</p>
186	<p>On-farm renewable energy production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the electricity consumed is generated by the farm's own installations that are run with renewable sources?</p>
200	<p>Covered slurry stores (or stable natural crust)</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep</p>	<p><i>Only ask/rate if slurry occurs:</i> Are slurry stores covered or does a stable natural crust cover the surface?</p>

Indicator number	Indicator name (Relevance)	Indicator description
288	<p>Arable land: Erosion control > 15 %</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Tropical crops</p>	<p>Are sufficient measures taken on agricultural areas (excluding permanent grassland) with sloping gradients higher than 15 % (up to 30%) to prevent erosion (e.g. contour ploughing)?</p>
299	<p>Arable land: Green cover > 30 %</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Care is taken on agricultural areas with sloping gradients higher than 30 % to ensure a good, continuous green cover (under sown crops, catch crops etc.)?</p>
229	<p>Ecological compensation areas: share of agricultural land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the agricultural area are ecological compensation areas / areas to promote biodiversity?</p> <p><i>Check for documents/evidence that areas are extensively cultivated or not cultivated at all.</i></p>
202	<p>Agro-forestry systems</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the farm's agricultural area is devoted to agro-forestry systems?</p>
208	<p>Woodlands: Share of agricultural land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the farmland (all area types of the farm) is woodland?</p>
204	<p>Woodlands: Deforestation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Which portion of the farm's current agricultural area has been deforested over the past 20 years?</p> <p><i>Remark: deforestation = removal of a forest or stand of trees were the land is thereafter converted to a non-forest use.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
215	Arable land: Share of temporary grasslands Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops	What proportion of the arable land is devoted to temporary grassland (grass-clover, ley, alfalfa etc.)?
521	Production of bioenergy crops Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tropical crops	On what proportion of the farm's agricultural area bioenergy crops are produced?
285	Humus Formation: Catch Crops Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops	On what proportion of the arable land are catch crops grown?
225	Arable land: Share of green cover outside growing period Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery	What proportion of the arable land is covered by vegetation outside the growing period? <i>EU: Period between 15. November und 15. February.</i>
237	Arable land: Share of mulching Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops	What proportion of the arable land is mulched? <i>Leaving only harvest residues on the field doesn't count as mulching (is assessed separately: ID 289).</i>
207	Arable land: Share of direct seeding Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops	What proportion of the arable land is managed by the method of direct seeding?
219	Arable land: Under sown crops Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops	What proportion of the arable land has cover crops under sown?
601	Permanent grasslands: Conversion Relevant for farms with the following activities: Arable farming, Vegetable production, Viticulture, Tropical crops	What proportion of permanent grasslands has been converted to arable land in the past 5 years?
602	Permanent grasslands: Renewal Relevant for farms with the following activities: Permanent grassland	What proportion of permanent grassland has been newly seeded in the past 5 years?

Indicator number	Indicator name (Relevance)	Indicator description
620	<p>Permanent grasslands: Mowing frequency</p> <p>Relevant for farms with the following activities: Permanent grassland</p>	How often is the grassland mowed on average?
182	<p>Plough less soil management</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	What proportion of the arable land is subject to zero / no-tillage or reduced tillage?
289	<p>Humus formation: Crop residues</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	On what proportion of the arable land crop residues (e.g. straw, beet tops) are not removed?
748	<p>Humus Formation: Humus balance</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	<p>1) Is the humus balance calculated?</p> <p>2) Is the humus balance positive, balanced or negative on average? <i>In case of small farms, check whether the farmer focuses on practices that improve humus balance</i></p>
741	<p>Steaming on open ground</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>1) Is soil steaming performed on open ground?</p> <p><i>If yes:</i></p> <p>2) Is deep or flat steaming performed?</p>
742	<p>Steaming in the greenhouse</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>1) Is soil steaming performed in the greenhouse?</p> <p><i>If yes:</i></p> <p>2) Is deep or flat steaming performed?</p>
290	<p>Determining fertilizer requirements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When determining fertilizer requirements, are soil analysis results and/or leaf-analysis considered?</p> <p><i>Soil analyses: Once every 5 years: pH, P and K / Annually: Nmin</i></p>
323	<p>Mineral N fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What is the farm's mineral N fertilizer (in kg) usage per hectare per year on its agricultural area?

Indicator number	Indicator name (Relevance)	Indicator description
308	<p>Farmyard manure</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion (volume) of the organic fertilizer used is farmyard manure?
309	<p>Compost</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the organic fertilizer used is compost (plant-based or livestock-based)?
201	<p>Slurry application with drag hose system or by injection</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Permanent grassland, Tree nursery / perennials</p>	<p><i>Only ask/rate if slurry occurs:</i></p> <p>On what proportion of the agricultural area does the farm use drag hose or injection systems to apply slurry?</p>
708	<p>Precise fertilisation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farm use systems for precise fertilisation (e.g. variable rate application methods, drip irrigation with mineral fertilisers)?
619	<p>Proportion drained arable land on moorland</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	<p>What is the proportion of drained arable land that is on moorland (including peatland, wetland)?</p> <p><i>Comment: Consider all dewatering measures of the past 20 years</i></p>
619,1	<p>Proportion drained arable land which is not on moorland</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	<p>What is the proportion of drained arable land that is not on moorland (including peatland, wetland)?</p> <p><i>Comment: Consider all dewatering measures of the past 20 years (e.g. draining, trenching)</i></p>
618	<p>Proportion drained permanent grassland on moorland</p> <p>Relevant for farms with the following activities: Permanent grassland, Tropical crops</p>	<p>What is the proportion of drained grassland that is on moorland (including peatland, wetland)?</p> <p><i>Comment: Consider all dewatering measures of the past 20 years</i></p>
618,1	<p>Proportion drained permanent grassland which is not on moorland</p> <p>Relevant for farms with the following activities: Permanent grassland, Tropical crops</p>	<p>What is the proportion of drained grassland that is not on moorland (including peatland, wetland)?</p> <p><i>Comment: Consider all dewatering measures of the past 20 years (e.g. draining, trenching)</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
159,5	Average number of lactations Relevant for farms with the following activities: Dairy cattle / Goats / Sheep	What is the average number of lactations of the dairy animals?
198	Dual-purpose breeds: Ruminants Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	What proportion of the ruminants are dual-purpose breeds? <i>Any dual-purpose breed that is only kept for one purpose (e.g. meat only/dairy only) does not count as a dual-purpose breed.</i>
198,1	Dual-purpose breeds: chickens Relevant for farms with the following activities: Poultry production	What proportion of the chickens are dual-purpose breeds? <i>Any dual-purpose breed that is only kept for one purpose (e.g. meat only/eggs only) does not count as a dual-purpose breed.</i>
249	Hybrid livestock (poultry, pigs) Relevant for farms with the following activities: Pig production, Poultry production, Bees, Aquaculture	Does the farm keep hybrid livestock (of poultry or pigs)?
370,5	Daily outdoor access for animals Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep	Do all animals have daily outdoor access (year-round)? <i>Score based on worst animal category</i> <i>For poultry: possibility for outdoor access is sufficient</i>
371	Access to pasture: Months per year Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	How many days per year are the ruminants out on pasture? Ask for summer and winter separately
372	Outdoor access for pigs: Hours per day Relevant for farms with the following activities: Pig production	On average, how many hours per day do the pigs have outdoor access?
373	Outdoor access for poultry: Hours per day Relevant for farms with the following activities: Poultry production	On average, how many hours per day do the poultry have outdoor access? <i>In case of several livestock housing/animal species: score based on the worst condition.</i>
626	Proportion bought-in roughage Relevant for farms with the following activities: Beef cattle, Pig production, Dairy cattle / Goats / Sheep	Which proportion of the used roughage is sourced externally?

Indicator number	Indicator name (Relevance)	Indicator description
517	Feed No Food: grazing livestock Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	What proportion of the feed given to grazing livestock would be suitable for human consumption (For maize silage take standard yields for grain maize)?
518	Feed No Food: non-grazing animals Relevant for farms with the following activities: Pig production, Poultry production, Aquaculture	What proportion of the feed given to non-grazing animals would be suitable for human consumption? <i>Contrary to e.g. waste products</i> <i>Score based on worst animal category</i>
374	Duration of transport to abattoir Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep	What is the average duration of livestock transportation to the abattoir (in minutes)? <i>Score based on worst animal category. If animals are slaughtered at the farm score positive.</i>
335,1	Recycling of paper/cardboards Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	What proportion of paper and cardboard is delivered to recycling points?
739	Reusable packaging materials Relevant for farms with the following activities: Vegetable production, Fruit production, Tree nursery / perennials, Pot plants / Plant nursery	Does the farm use reusable and multiple-use packaging? <i>Consider buying and selling.</i>
788	Open burning of farm or household wastes and bushes Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops	Does the farm refrain from burning of bushes, crop residues and household/farm wastes?
190	Biogas plant: share organic residues Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	What proportion of organic matter - that is a surplus or leftover from food/feed production - is utilized in a biogas plant (own or external plant)?

Indicator number	Indicator name (Relevance)	Indicator description
332	<p>Electricity consumption per ha</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How much electricity is used on the farm per hectare per year?</p> <p><i>Make sure private use is not included. If only one electric meter, calculate deduction based on number of people. For private use 1.000 kWh/adult/year and 500 kWh/child/year can be deducted</i></p>
185	<p>Renewables electricity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the electricity consumed is derived from renewable resources?</p>
348	<p>Share of fuel from renewable sources</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the fuel consumption is provided by renewable resources?</p>
188	<p>Share of fuel from own production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Which proportion of the fuel used for farm vehicles and machinery is produced on-farm?</p>
195	<p>Energy-efficient driving (Eco-Drive)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do the farm manager and the employees use energy-efficient driving techniques (e.g. Eco-Drive advice: low speed of engine (revolutions per minute) and driving with high gears if possible etc.)?</p>

Indicator number	Indicator name (Relevance)	Indicator description
192	<p>Plants for energy production instead of human consumption</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If a farm uses plant materials for energy production:</i></p> <p>What part of the substrate used for energy production would also be suitable for human consumption?</p>
187	<p>Renewables heating and hot water</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture</p>	<p>What proportion of the heating-energy consumption is provided by renewable energy or waste heat?</p> <p><i>Only consider consumption related to agricultural production</i></p>
196	<p>Insulation of heated farm buildings</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If there are heated farm buildings:</i></p> <p>What proportion of the heated farm buildings are sufficiently insulated (e.g. with double or multiple glazed windows, roof / wall / floor insulation)?</p> <p><i>Do not score heated greenhouses, covered in ID 745</i></p>
203	<p>On-farm renewable heat production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture</p>	<p>What proportion of the heating-energy used is generated by the farm's own installations that are run with renewable sources (wood chips, geothermal, solar)?</p>
345	<p>Irrigation: Low energy technology and pumps</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p><i>Only ask/rate if irrigation is used:</i></p> <p>Does the farm use low-energy irrigation technology and pumps, drip irrigation and micro irrigation?</p> <p><i>Score positively if it is done manually</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
162	<p>Procurement < 50 km</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>What proportion of externally sourced feed comes from within 50 km of the farm?</p> <p><i>In cases in which the origin of feed is unknown add it to ID164 (Procurement > 500 km).</i></p> <p><i>This refers to the original source of the inputs, not the point of sale.</i></p>
164	<p>Procurement > 500 km</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>What proportion of externally sourced feed comes from more than 500 km from the farm?</p> <p><i>All feed with unknown origin is added to this indicator.</i></p> <p><i>This refers to the original source of the inputs, not the point of sale.</i></p>
737	<p>Use of synthetic aggregates for soil and substrate</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>Does the farm use synthetic aggregates or chemically treated wood products (e.g. bark mulch) for the substrate?</p>
733	<p>Peat: Usage for seedling production</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>What is the proportion of peat in the substrate used for seedling production?</p>
734	<p>Peat: Usage for further growth</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>What is the proportion of peat in the substrate used for further growth (estimated)?</p>
735	<p>Peat: Usage in grown soil</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>Does the farm use peat in grown soil?</p>
736	<p>Peat: Origin</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>Is there a risk that the peat used on the farm comes from proclaimed nature conservation areas or is of doubtful origin?</p> <p><i>If the peat is environmentally certified, answer no (labels: RPP, Veriflora).</i></p>

Tab. S17 SMART Indicators for the Sub-Theme “Air Quality”

Indicator number	Indicator name (Relevance)	Indicator description
253	<p>Permanent grasslands: Extensively managed</p> <p>Relevant for farms with the following activities: Arable farming, Permanent grassland, Beef cattle, Pig production, Poultry production, Tropical crops</p>	<p>What proportion of the area of permanent grassland is under extensive management?</p> <p>Extensive means: double mowing/grazing or less, zero application of fertilizers / pesticides</p>
206	<p>Share of legumes on arable land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the arable land is devoted to leguminous crops?</p>
764	<p>Share of legumes on perennial crops area</p> <p>Relevant for farms with the following activities: Fruit production, Viticulture, Tree nursery / perennials</p>	<p>What proportion of the perennial crops area is devoted to legumes?</p>
712	<p>Bought-in organic fertilisers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>What proportion of the entire organic fertilisers used is externally sourced?</p> <p><i>In the past 5 years - average per year?</i></p> <p><i>Green manure not counted in calculation</i></p>
199	<p>Bought-in concentrated feed</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>What proportion of the concentrate feed used on the farm is sourced externally?</p>
720	<p>Silage storage</p> <p>Relevant for farms with the following activities: Permanent grassland, Beef cattle, Pig production, Dairy cattle / Goats / Sheep</p>	<p>Is the silage stored appropriately to minimize losses and avoid contamination?</p>
380	<p>On-farm point sources of nutrients and pollutants</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Can it be excluded that there are direct point source emissions of nutrients and pollutants to the atmosphere and water bodies (incl. wells and drinking water sources) on the farm and its utilized areas?</p> <p><i>e.g. exports (= emissions through discharge and degas) from exercise yards, farmyard manure stores, livestock water facilities or shelter of animals near to water on pastures, direct entry of animals into the water and cleaning areas.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
511	<p>Contamination through emissions: exhaust emissions, factories or airports</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk of contamination from motorways/heavy traffic roads, industry or airports?</p>
341	<p>Settings of combustion motors</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How often are the settings of combustion motors of vehicles (e.g. tractor, stapler) and other machineries checked and adjusted (engine, air filter etc.)? e.g.: based on exhaust emissions test results If no tractor is use give highest score.</p>
186	<p>On-farm renewable energy production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the electricity consumed is generated by the farm's own installations that are run with renewable sources?</p>
200	<p>Covered slurry stores (or stable natural crust)</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep</p>	<p><i>Only ask/rate if slurry occurs:</i> Are slurry stores covered or does a stable natural crust cover the surface?</p>
202	<p>Agro-forestry systems</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the farm's agricultural area is devoted to agro-forestry systems?</p>

Indicator number	Indicator name (Relevance)	Indicator description
208	<p>Woodlands: Share of agricultural land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the farmland (all area types of the farm) is woodland?
204	<p>Woodlands: Deforestation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Which portion of the farm's current agricultural area has been deforested over the past 20 years?</p> <p><i>Remark: deforestation = removal of a forest or stand of trees were the land is thereafter converted to a non-forest use.</i></p>
207	<p>Arable land: Share of direct seeding</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	What proportion of the arable land is managed by the method of direct seeding?
620	<p>Permanent grasslands: Mowing frequency</p> <p>Relevant for farms with the following activities: Permanent grassland</p>	How often is the grassland mowed on average?
286	<p>Soil degradation: Measures taken to counter</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>On what proportion of the agricultural area are measures taken to combat relevant soil degradation processes on the farm (e.g. compaction, pollution)?</p> <p><i>Do not consider erosion (already covered in other indicators), see list of examples, award full points if no degradation processes are evident.</i></p>
748	<p>Humus Formation: Humus balance</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	<p>1) Is the humus balance calculated?</p> <p>2) Is the humus balance positive, balanced or negative on average? <i>In case of small farms, check whether the farmer focuses on practices that improve humus balance</i></p>
741	<p>Steaming on open ground</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>1) Is soil steaming performed on open ground?</p> <p><i>If yes:</i></p> <p>2) Is deep or flat steaming performed?</p>

Indicator number	Indicator name (Relevance)	Indicator description
742	Steaming in the greenhouse Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops	1) Is soil steaming performed in the greenhouse? <i>If yes:</i> 2) Is deep or flat steaming performed?
749	Soil disinfection Relevant for farms with the following activities: Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	1) On which proportion of the agricultural area are soil disinfection chemicals (e.g. fumigation) applied? <i>If no:</i> 2) Is documentation and justification for the use of soil disinfection products available?
290	Determining fertilizer requirements Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	When determining fertilizer requirements, are soil analysis results and/or leaf-analysis considered? <i>Soil analyses: Once every 5 years: pH, P and K / Annually: N min</i>
323	Mineral N fertilizers Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	What is the farm's mineral N fertilizer (in kg) usage per hectare per year on its agricultural area?
308	Farmyard manure Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	What proportion (volume) of the organic fertilizer used is farmyard manure?
309	Compost Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	What proportion of the organic fertilizer used is compost (plant-based or livestock-based)?
201	Slurry application with drag hose system or by injection Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Permanent grassland, Tree nursery / perennials	<i>Only ask/rate if slurry occurs:</i> On what proportion of the agricultural area does the farm use drag hose or injection systems to apply slurry?

Indicator number	Indicator name (Relevance)	Indicator description
708	<p>Precise fertilisation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farm use systems for precise fertilisation (e.g. variable rate application methods, drip irrigation with mineral fertilisers)?
231	<p>No use of synth. chem. herbicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the agricultural area does not receive synthetic chemical herbicide applications?
233	<p>No use of synth. chem. fungicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	What proportion of the agricultural area does not receive synthetic chemical fungicide applications?
234	<p>No use of synth. chem. insecticides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	What proportion of the agricultural area does not receive synthetic chemical insecticide applications? <i>Spinosad, Neem and other broad-range organic insecticides count.</i>
377,75	<p>Pesticides: Acute toxicity inhalation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Pesticides: Are active substances used, which are considered acute toxic when inhaled by the users according to the "Globally Harmonized System of Classification (GHS)"?
740	<p>Growth regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farm decline to use synthetic chemical growth regulators ?
747	<p>Flowering regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farm use products to influence the flowering of plants or for desiccation ? <i>Rate positive for nature identical ethylene gas.</i>

Indicator number	Indicator name (Relevance)	Indicator description
198	<p>Dual-purpose breeds: Ruminants</p> <p>Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep</p>	<p>What proportion of the ruminants are dual-purpose breeds?</p> <p><i>Any dual-purpose breed that is only kept for one purpose (e.g. meat only/dairy only) does not count as a dual-purpose breed.</i></p>
198,1	<p>Dual-purpose breeds: chickens</p> <p>Relevant for farms with the following activities: Poultry production</p>	<p>What proportion of the chickens are dual-purpose breeds?</p> <p><i>Any dual-purpose breed that is only kept for one purpose (e.g. meat only/eggs only) does not count as a dual-purpose breed.</i></p>
370,5	<p>Daily outdoor access for animals</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep</p>	<p>Do all animals have daily outdoor access (year-round)?</p> <p><i>Score based on worst animal category</i></p> <p><i>For poultry: possibility for outdoor access is sufficient</i></p>
371	<p>Access to pasture: Months per year</p> <p>Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep</p>	<p>How many days per year are the ruminants out on pasture?</p> <p>Ask for summer and winter separately</p>
372	<p>Outdoor access for pigs: Hours per day</p> <p>Relevant for farms with the following activities: Pig production</p>	<p>On average, how many hours per day do the pigs have outdoor access?</p>
373	<p>Outdoor access for poultry: Hours per day</p> <p>Relevant for farms with the following activities: Poultry production</p>	<p>On average, how many hours per day do the poultry have outdoor access?</p> <p><i>In case of several livestock housing/animal species: score based on the worst condition.</i></p>
626	<p>Proportion bought-in roughage</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Dairy cattle / Goats / Sheep</p>	<p>Which proportion of the used roughage is sourced externally?</p>
517	<p>Feed No Food: grazing livestock</p> <p>Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep</p>	<p>What proportion of the feed given to grazing livestock would be suitable for human consumption (For maize silage take standard yields for grain maize)?</p>
518	<p>Feed No Food: non-grazing animals</p> <p>Relevant for farms with the following activities: Pig production, Poultry production, Aquaculture</p>	<p>What proportion of the feed given to non-grazing animals would be suitable for human consumption?</p> <p><i>Contrary to e.g. waste products</i></p> <p><i>Score based on worst animal category</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
374	<p>Duration of transport to abattoir</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep</p>	<p>What is the average duration of livestock transportation to the abattoir (in minutes)?</p> <p><i>Score based on worst animal category. If animals are slaughtered at the farm score positive.</i></p>
331	<p>Waste disposal: cadaver livestock</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Are all animal wastes/cadavers disposed properly (not harm human to health and environment)?</p> <p><i>Score positive if no such wastes arise</i></p>
738	<p>Production materials: Use of problematic elements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm only use production materials made of less problematic plastic types?</p> <p><i>Check problematic materials (e.g. PVC, polystyrene)</i></p>
788	<p>Open burning of farm or household wastes and bushes</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm refrain from burning of bushes, crop residues and household/farm wastes?</p>
190	<p>Biogas plant: share organic residues</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of organic matter - that is a surplus or leftover from food/feed production - is utilized in a biogas plant (own or external plant)?</p>
332	<p>Electricity consumption per ha</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How much electricity is used on the farm per hectare per year?</p> <p><i>Make sure private use is not included. If only one electric meter, calculate deduction based on number of people. For private use 1.000 kWh/adult/year and 500 kWh/child/year can be deducted</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
185	<p>Renewables electricity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the electricity consumed is derived from renewable resources?</p>
348	<p>Share of fuel from renewable sources</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the fuel consumption is provided by renewable resources?</p>
188	<p>Share of fuel from own production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Which proportion of the fuel used for farm vehicles and machinery is produced on-farm?</p>
195	<p>Energy-efficient driving (Eco-Drive)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do the farm manager and the employees use energy-efficient driving techniques (e.g. Eco-Drive advice: low speed of engine (revolutions per minute) and driving with high gears if possible etc.)?</p>
192	<p>Plants for energy production instead of human consumption</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If a farm uses plant materials for energy production:</i> What part of the substrate used for energy production would also be suitable for human consumption?</p>

Indicator number	Indicator name (Relevance)	Indicator description
187	<p>Renewables heating and hot water</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture</p>	<p>What proportion of the heating-energy consumption is provided by renewable energy or waste heat?</p> <p><i>Only consider consumption related to agricultural production</i></p>
196	<p>Insulation of heated farm buildings</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If there are heated farm buildings:</i></p> <p>What proportion of the heated farm buildings are sufficiently insulated (e.g. with double or multiple glazed windows, roof / wall / floor insulation)?</p> <p><i>Do not score heated greenhouses, covered in ID 745</i></p>
203	<p>On-farm renewable heat production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture</p>	<p>What proportion of the heating-energy used is generated by the farm's own installations that are run with renewable sources (wood chips, geothermal, solar)?</p>
345	<p>Irrigation: Low energy technology and pumps</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p><i>Only ask/rate if irrigation is used:</i></p> <p>Does the farm use low-energy irrigation technology and pumps, drip irrigation and micro irrigation?</p> <p><i>Score positively if it is done manually</i></p>
162	<p>Procurement < 50 km</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>What proportion of externally sourced feed comes from within 50 km of the farm?</p> <p><i>In cases in which the origin of feed is unknown add it to ID164 (Procurement > 500 km).</i></p> <p><i>This refers to the original source of the inputs, not the point of sale.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
164	<p>Procurement > 500 km</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>What proportion of externally sourced feed comes from more than 500 km from the farm?</p> <p><i>All feed with unknown origin is added to this indicator. This refers to the original source of the inputs, not the point of sale.</i></p>

Tab. S18 SMART Indicators for the Sub-Theme “Water Withdrawal”

Indicator number	Indicator name (Relevance)	Indicator description
376,1	<p>Information on water availability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>In case there is a risk of temporary water scarcity, does the farm have access to information on water availability (e.g. groundwater level)?</p>
376,2	<p>Information on water quality</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have access to information on water quality (analysis of water quality)?</p>
383	<p>Annual water consumption per ha (entire farm)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture</p>	<p>How much water is consumed on the farm per hectare per year?</p> <p><i>If own water spring: Let the amount be assessed and add it.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
398	<p>Use of non-renewable (fossil) water resources</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is there a risk that water from non-renewable (fossil) water resources is used on the farm?
389	<p>Irrigation: Water consumption per ha</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	How much water (in m3 per ha) is used annually for irrigation purposes on the farm?
399	<p>Use of rainwater</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the farms water consumption is provided by collected rainwater?
404	<p>Irrigation: Precipitation measurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Is precipitation measured and recorded with a view to calculating irrigation quantities, taking into account local evapotranspiration rates?
387	<p>Water use efficiency</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery</p>	Are techniques applied to improve water use efficiency?
377	<p>Wastewater: Re-use</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is all wastewater produced on the farm re-used?

Indicator number	Indicator name (Relevance)	Indicator description
377,05	<p>Wastewater: Disposal</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is all wastewater produced on the farm correctly discharged (into sewer for treatment)?
400	<p>Yield decreases resulting from lack of water</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Were yields limited during the past 5 years as a result of lack of water (more than 20% reduction either in livestock and/or crop production yield)?
405	<p>Water storage capacity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Do sufficient capacities exist for water storage on the farm (retention basins, cisterns)?
245	<p>Locally adapted livestock breeds</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	Are locally adapted livestock breeds kept on the farm?
739	<p>Reusable packaging materials</p> <p>Relevant for farms with the following activities: Vegetable production, Fruit production, Tree nursery / perennials, Pot plants / Plant nursery</p>	Does the farm use reusable and multiple-use packaging? <i>Consider buying and selling.</i>
403	<p>Conflicts over water quantity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Are there, or have there been, any conflicts with other water users / stakeholders in the farm's neighbourhood over access to water and the volume of water used ?

Tab. S19 SMART Indicators for the Sub-Theme “Water Quality”

Indicator number	Indicator name (Relevance)	Indicator description
253	<p>Permanent grasslands: Extensively managed</p> <p>Relevant for farms with the following activities: Arable farming, Permanent grassland, Beef cattle, Pig production, Poultry production, Tropical crops</p>	<p>What proportion of the area of permanent grassland is under extensive management?</p> <p>Extensive means: double mowing/grazing or less, zero application of fertilizers / pesticides</p>
764	<p>Share of legumes on perennial crops area</p> <p>Relevant for farms with the following activities: Fruit production, Viticulture, Tree nursery / perennials</p>	<p>What proportion of the perennial crops area is devoted to legumes?</p>
700	<p>Measures to prevent erosion</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>Are sufficient measures taken on agricultural areas (excluding permanent grassland) with sloping gradients lower than 15 % to prevent erosion?</p> <p><i>Consider: cropping techniques, type of crop, gradients, weather conditions (wind, rainfall etc.).</i></p>
720	<p>Silage storage</p> <p>Relevant for farms with the following activities: Permanent grassland, Beef cattle, Pig production, Dairy cattle / Goats / Sheep</p>	<p>Is the silage stored appropriately to minimize losses and avoid contamination?</p>
719,1	<p>Poultry: cover of vegetation at open-air access</p> <p>Relevant for farms with the following activities: Poultry production</p>	<p><i>If there is an open-air access for poultry:</i></p> <p>What is the percentage of vegetation coverage of the open-air access?</p> <p><i>Score based on worst poultry access.</i></p>
378	<p>Distance manure heap to waters</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tropical crops</p>	<p>Is the shortest distance between the “worst” of the storage facilities for livestock wastes or silage and the nearest water resource (well, open drain, sewer, river) more than 30m?</p>
380	<p>On-farm point sources of nutrients and pollutants</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Can it be excluded that there are direct point source emissions of nutrients and pollutants to the atmosphere and water bodies (incl. wells and drinking water sources) on the farm and its utilized areas?</p> <p><i>e.g. exports (= emissions through discharge and degas) from exercise yards, farmyard manure stores, livestock water facilities or shelter of animals near to water on pastures, direct entry of animals into the water and cleaning areas.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
300	<p>Arable land: Gradients > 15 % Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the arable land has gradients above 15 %?</p>
288	<p>Arable land: Erosion control > 15 % Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Tropical crops</p>	<p>Are sufficient measures taken on agricultural areas (excluding permanent grassland) with sloping gradients higher than 15 % (up to 30%) to prevent erosion (e.g. contour ploughing)?</p>
299	<p>Arable land: Green cover > 30 % Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Care is taken on agricultural areas with sloping gradients higher than 30 % to ensure a good, continuous green cover (under sown crops, catch crops etc.)?</p>
229	<p>Ecological compensation areas: share of agricultural land Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the agricultural area are ecological compensation areas / areas to promote biodiversity? <i>Check for documents/evidence that areas are extensively cultivated or not cultivated at all.</i></p>
605	<p>Management of riparian strips Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are the riparian strips extensively managed (minimum width 3m, no cultivation, no fertilizers, no pesticides)?</p>
208	<p>Woodlands: Share of agricultural land Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the farmland (all area types of the farm) is woodland?</p>

Indicator number	Indicator name (Relevance)	Indicator description
204	<p>Woodlands: Deforestation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Which portion of the farm's current agricultural area has been deforested over the past 20 years?</p> <p><i>Remark: deforestation = removal of a forest or stand of trees were the land is thereafter converted to a non-forest use.</i></p>
215	<p>Arable land: Share of temporary grasslands</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>What proportion of the arable land is devoted to temporary grassland (grass-clover, ley, alfalfa etc.)?</p>
285	<p>Humus Formation: Catch Crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>On what proportion of the arable land are catch crops grown?</p>
225	<p>Arable land: Share of green cover outside growing period</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>What proportion of the arable land is covered by vegetation outside the growing period?</p> <p><i>EU: Period between 15. November und 15. February.</i></p>
207	<p>Arable land: Share of direct seeding</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>What proportion of the arable land is managed by the method of direct seeding?</p>
219	<p>Arable land: Under sown crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	<p>What proportion of the arable land has cover crops under sown?</p>
601	<p>Permanent grasslands: Conversion</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Viticulture, Tropical crops</p>	<p>What proportion of permanent grasslands has been converted to arable land in the past 5 years?</p>
602	<p>Permanent grasslands: Renewal</p> <p>Relevant for farms with the following activities: Permanent grassland</p>	<p>What proportion of permanent grassland has been newly seeded in the past 5 years?</p>

Indicator number	Indicator name (Relevance)	Indicator description
743	<p>Sealed areas</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the total farm area is sealed (i.e. concrete, paved)?</p>
286	<p>Soil degradation: Measures taken to counter</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>On what proportion of the agricultural area are measures taken to combat relevant soil degradation processes on the farm (e.g. compaction, pollution)?</p> <p><i>Do not consider erosion (already covered in other indicators), see list of examples, award full points if no degradation processes are evident.</i></p>
182	<p>Plough less soil management</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the arable land is subject to zero / no-tillage or reduced tillage?</p>
301	<p>Contamination tests before using bought-in fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>Only in cases, in which external organic fertilizers are applied (e.g. compost, sewage, sludge):</i></p> <p>Are only substances applied (e.g. composts, sewage sludge, wastewater) that have been tested for contamination beforehand (primarily heavy metals, antibiotics) and found to be safe?</p> <p><i>Rate positive if fertilizers from other organic farms are applied.</i></p>
606	<p>Landslides and mudslides on agricultural area</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Tropical crops</p>	<p>Were there landslides and/or local mudslides on the farms agricultural area in the past 10 years?</p>
749	<p>Soil disinfection</p> <p>Relevant for farms with the following activities: Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>1) On which proportion of the agricultural area are soil disinfection chemicals (e.g. fumigation) applied?</p> <p><i>If no:</i></p> <p>2) Is documentation and justification for the use of soil disinfection products available?</p>

Indicator number	Indicator name (Relevance)	Indicator description
320	<p>Crop resistance</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Are cultivars chosen with a view to resistance to harmful organisms and diseases?</p>
290	<p>Determining fertilizer requirements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When determining fertilizer requirements, are soil analysis results and/or leaf-analysis considered?</p> <p><i>Soil analyses: Once every 5 years: pH, P and K / Annually: N min</i></p>
323	<p>Mineral N fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What is the farm's mineral N fertilizer (in kg) usage per hectare per year on its agricultural area?</p>
324	<p>Mineral P fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What is the farm's total easily dissolvable mineral P fertilizer usage (P₂O₅ in kg) per hectare per year (active P ingredients) on its agricultural area?</p>
309	<p>Compost</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the organic fertilizer used is compost (plant-based or livestock-based)?</p>
295	<p>Antibiotics from livestock in fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that manure/slurry from livestock treated with antibiotics is applied to the agricultural area?</p>
201	<p>Slurry application with drag hose system or by injection</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Permanent grassland, Tree nursery / perennials</p>	<p><i>Only ask/rate if slurry occurs:</i></p> <p>On what proportion of the agricultural area does the farm use drag hose or injection systems to apply slurry?</p>

Indicator number	Indicator name (Relevance)	Indicator description
708	<p>Precise fertilisation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farm use systems for precise fertilisation (e.g. variable rate application methods, drip irrigation with mineral fertilisers)?
710	<p>Harmful substances P-fertilisers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Does the farm only use mineral P-fertilisers, which comply with the limits of harmful substances (heavy metals and uranium)?
231	<p>No use of synth. chem. herbicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the agricultural area does not receive synthetic chemical herbicide applications?
233	<p>No use of synth. chem. fungicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	What proportion of the agricultural area does not receive synthetic chemical fungicide applications?
234	<p>No use of synth. chem. insecticides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	What proportion of the agricultural area does not receive synthetic chemical insecticide applications? <i>Spinosad, Neem and other broad-range organic insecticides count.</i>
377,1	<p>Pesticides: Number of active substances</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	How many active substances of pesticides are used per year?

Indicator number	Indicator name (Relevance)	Indicator description
257,2	<p>Pesticides: Toxicity aquatic organisms</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered to be toxic to aquatic organisms according to the "PAN Pesticide Database"?</p> <p><i>The strongest impact on organisms of all active ingredients used is assessed</i></p>
474,1	<p>Pesticides: Persistence water</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered very persistent in water (half-life > 60 days) according to the "PAN Pesticide Database"?</p>
474,2	<p>Pesticides: Persistence soil</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered to be very persistent in soil (half-life > 180 days) according to the "PAN Pesticide Database"?</p>
740	<p>Growth regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm decline to use synthetic chemical growth regulators?</p>
747	<p>Flowering regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm use products to influence the flowering of plants or for desiccation?</p> <p><i>Rate positive for nature identical ethylene gas.</i></p>
376,1	<p>Information on water availability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>In case there is a risk of temporary water scarcity, does the farm have access to information on water availability (e.g. groundwater level)?</p>
376,2	<p>Information on water quality</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have access to information on water quality (analysis of water quality)?</p>

Indicator number	Indicator name (Relevance)	Indicator description
377,05	<p>Wastewater: Disposal</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is all wastewater produced on the farm correctly discharged (into sewer for treatment)?
608	<p>Use of antibiotic drying agents</p> <p>Relevant for farms with the following activities: Dairy cattle / Goats / Sheep</p>	Does the farm use antibiotic drying agents?
353	<p>Livestock health: Proportion of prophylactic treatments</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	What proportion of the animals (across all livestock categories) was given prophylactic treatments, preventive before any clinical signs of disease, including for purposes of enhanced performance, during the past year?
613	<p>Livestock health: Hormonal treatment for problems with livestock in heat</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Dairy cattle / Goats / Sheep</p>	Does the farm use hormonal treatments for livestock with in-heat problems?
765	<p>Correct waste disposal</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is all operational/commercial waste disposed correctly?</p> <p>Exclude pesticides and veterinary medicines (already covered in ID 327)</p> <p>Consider waste e.g.: <i>Waste oil, used tyres, batteries, plastics, metal, paper/cardboard, glass and other waste</i></p> <p><i>Comment: score positive if waste is collected by public/private services (for e.g. incineration, covered land-fill)</i></p>
327	<p>Waste disposal: pesticides and veterinary medicines</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are all waste materials from plant protection products and veterinary medicines disposed properly?</p> <p><i>Score positive if no such wastes arise</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
334	<p>Recycling of waste oil</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the used oil is delivered to recycling points?
334,1	<p>Recycling of used tyres</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of used tyres is delivered to recycling points?
334,2	<p>Recycling of used batteries</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of used batteries is delivered to recycling points?
334,3	<p>Recycling of plastic waste</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the plastic waste is delivered to recycling points?
334,5	<p>Recycling of waste glass</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the waste glass is delivered to recycling points?
331	<p>Waste disposal: cadaver livestock</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Are all animal wastes/cadavers disposed properly (not harm human to health and environment)?</p> <p><i>Score positive if no such wastes arise</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
738	<p>Production materials: Use of problematic elements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm only use production materials made of less problematic plastic types?</p> <p><i>Check problematic materials (e.g. PVC, polystyrene)</i></p>
402	<p>Conflicts over water quality</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are there, or have there been, any conflicts with other water users / stakeholders over water quality in the farm's neighbourhood?</p>

Tab. S20 SMART Indicators for the Sub-Theme "Soil Quality"

Indicator number	Indicator name (Relevance)	Indicator description
222	<p>Permanent grasslands: Share of agricultural area</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Tropical crops</p>	<p>What proportion of the agricultural area is devoted to permanent grassland?</p>
253	<p>Permanent grasslands: Extensively managed</p> <p>Relevant for farms with the following activities: Arable farming, Permanent grassland, Beef cattle, Pig production, Poultry production, Tropical crops</p>	<p>What proportion of the area of permanent grassland is under extensive management?</p> <p>Extensive means: double mowing/grazing or less, zero application of fertilizers / pesticides</p>
206	<p>Share of legumes on arable land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the arable land is devoted to leguminous crops?</p>

Indicator number	Indicator name (Relevance)	Indicator description
764	Share of legumes on perennial crops area Relevant for farms with the following activities: Fruit production, Viticulture, Tree nursery / perennials	What proportion of the perennial crops area is devoted to legumes?
700	Measures to prevent erosion Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops	Are sufficient measures taken on agricultural areas (excluding permanent grassland) with sloping gradients lower than 15 % to prevent erosion? <i>Consider: cropping techniques, type of crop, gradients, weather conditions (wind, rainfall etc.).</i>
705	Substrate (Soilless) production Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery	Does the farm have substrate (soilless) production systems? <i>Example: substrate, hydroponics.</i>
378	Distance manure heap to waters Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tropical crops	Is the shortest distance between the “worst” of the storage facilities for livestock wastes or silage and the nearest water resource (well, open drain, sewer, river) more than 30m?
380	On-farm point sources of nutrients and pollutants Relevant for farms with the following activities: Arable farming, Vegetable production, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture	Can it be excluded that there are direct point source emissions of nutrients and pollutants to the atmosphere and water bodies (incl. wells and drinking water sources) on the farm and its utilized areas? <i>e.g. exports (= emissions through discharge and degas) from exercise yards, farmyard manure stores, livestock water facilities or shelter of animals near to water on pastures, direct entry of animals into the water and cleaning areas.</i>
300	Arable land: Gradients > 15 % Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops	What proportion of the arable land has gradients above 15 %?
288	Arable land: Erosion control > 15 % Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Tropical crops	Are sufficient measures taken on agricultural areas (excluding permanent grassland) with sloping gradients higher than 15 % (up to 30%) to prevent erosion (e.g. contour ploughing)?

Indicator number	Indicator name (Relevance)	Indicator description
299	<p>Arable land: Green cover > 30 %</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Care is taken on agricultural areas with sloping gradients higher than 30 % to ensure a good, continuous green cover (under sown crops, catch crops etc.)?
767	<p>Land ownership</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farmer have secure tenure rights over the land for at least 10 years?
229	<p>Ecological compensation areas: share of agricultural land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the agricultural area are ecological compensation areas / areas to promote biodiversity?</p> <p><i>Check for documents/evidence that areas are extensively cultivated or not cultivated at all.</i></p>
244	<p>Number of scattered fruit trees</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	How many scattered fruit trees does the farm have (trees per ha agricultural area)?
202	<p>Agro-forestry systems</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the farm's agricultural area is devoted to agro-forestry systems?
208	<p>Woodlands: Share of agricultural land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the farmland (all area types of the farm) is woodland?

Indicator number	Indicator name (Relevance)	Indicator description
204	<p>Woodlands: Deforestation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Which portion of the farm's current agricultural area has been deforested over the past 20 years?</p> <p><i>Remark: deforestation = removal of a forest or stand of trees were the land is thereafter converted to a non-forest use.</i></p>
236	<p>Number of elements in crop rotation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>How many elements does the crop rotation consist of?</p> <p><i>Count perennial clover grass as one crop</i></p>
758	<p>Number of perennial crops</p> <p>Relevant for farms with the following activities: Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>How many different perennial crops are grown on the farm's agricultural area?</p> <p><i>Count perennial crops if more than 10% of agricultural area.</i></p>
215	<p>Arable land: Share of temporary grasslands</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>What proportion of the arable land is devoted to temporary grassland (grass-clover, ley, alfalfa etc.)?</p>
285	<p>Humus Formation: Catch Crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>On what proportion of the arable land are catch crops grown?</p>
225	<p>Arable land: Share of green cover outside growing period</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>What proportion of the arable land is covered by vegetation outside the growing period?</p> <p><i>EU: Period between 15. November und 15. February.</i></p>
237	<p>Arable land: Share of mulching</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the arable land is mulched?</p> <p><i>Leaving only harvest residues on the field doesn't count as mulching (is assessed separately: ID 289).</i></p>
207	<p>Arable land: Share of direct seeding</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>What proportion of the arable land is managed by the method of direct seeding?</p>

Indicator number	Indicator name (Relevance)	Indicator description
219	<p>Arable land: Under sown crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	What proportion of the arable land has cover crops under sown?
601	<p>Permanent grasslands: Conversion</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Viticulture, Tropical crops</p>	What proportion of permanent grasslands has been converted to arable land in the past 5 years?
602	<p>Permanent grasslands: Renewal</p> <p>Relevant for farms with the following activities: Permanent grassland</p>	What proportion of permanent grassland has been newly seeded in the past 5 years?
296	<p>Soil degradation: Share of agricultural area</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Pig production, Poultry production, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the agricultural area has been degraded over the last 20 years or can no longer be used for farming?
743	<p>Sealed areas</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the total farm area is sealed (i.e. concrete, paved)?
286	<p>Soil degradation: Measures taken to counter</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	On what proportion of the agricultural area are measures taken to combat relevant soil degradation processes on the farm (e.g. compaction, pollution)? <i>Do not consider erosion (already covered in other indicators), see list of examples, award full points if no degradation processes are evident.</i>
281	<p>Soil degradation: Severe soil compaction</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	On what proportion of the agricultural area has been signs of severe soil compaction (caused by either machinery or livestock)?

Indicator number	Indicator name (Relevance)	Indicator description
287	<p>Soil degradation: Compaction due to heavy machinery</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>When heavy machinery is used, are measures taken to reduce wheel load (twin tyres) and surface contact pressure (reduced inflation pressure)?</p>
298	<p>Soil improvement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of formerly degraded lands (not suitable for farming) has been regenerated over the past 20 years and can again be used for farming? <i>Measures include e.g. compost applications, liming, fertilizer applications</i> <i>Full score for completely fertile soils</i></p>
182	<p>Plough less soil management</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the arable land is subject to zero / no-tillage or reduced tillage?</p>
301	<p>Contamination tests before using bought-in fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>Only in cases, in which external organic fertilizers are applied (e.g. compost, sewage, sludge):</i> Are only substances applied (e.g. composts, sewage sludge, wastewater) that have been tested for contamination beforehand (primarily heavy metals, antibiotics) and found to be safe? <i>Rate positive if fertilizers from other organic farms are applied.</i></p>
294	<p>Soil analyses for heavy metals</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Have soil analyses been carried out over the past 20 years with a view to assessing heavy metal contamination (of soils or ponds), and, in case of positive tests, were further monitoring analyses undertaken?</p>
289	<p>Humus formation: Crop residues</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>On what proportion of the arable land crop residues (e.g. straw, beet tops) are not removed?</p>
748	<p>Humus Formation: Humus balance</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	<p>1) Is the humus balance calculated? 2) Is the humus balance positive, balanced or negative on average? <i>In case of small farms, check whether the farmer focuses on practices that improve humus balance</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
741	Steaming on open ground Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops	1) Is soil steaming performed on open ground? <i>If yes:</i> 2) Is deep or flat steaming performed?
742	Steaming in the greenhouse Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops	1) Is soil steaming performed in the greenhouse? <i>If yes:</i> 2) Is deep or flat steaming performed?
749	Soil disinfection Relevant for farms with the following activities: Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	1) On which proportion of the agricultural area are soil disinfection chemicals (e.g. fumigation) applied? <i>If no:</i> 2) Is documentation and justification for the use of soil disinfection products available?
320	Crop resistance Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops	Are cultivars chosen with a view to resistance to harmful organisms and diseases?
290	Determining fertilizer requirements Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	When determining fertilizer requirements, are soil analysis results and/or leaf-analysis considered? <i>Soil analyses: Once every 5 years: pH, P and K / Annually: Nmin</i>
323	Mineral N fertilizers Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	What is the farm's mineral N fertilizer (in kg) usage per hectare per year on its agricultural area?
324	Mineral P fertilizers Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	What is the farm's total easily dissolvable mineral P fertilizer usage (P ₂ O ₅ in kg) per hectare per year (active P ingredients) on its agricultural area?

Indicator number	Indicator name (Relevance)	Indicator description
308	<p>Farmyard manure</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion (volume) of the organic fertilizer used is farmyard manure?
309	<p>Compost</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the organic fertilizer used is compost (plant-based or livestock-based)?
295	<p>Antibiotics from livestock in fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is there a risk that manure/slurry from livestock treated with antibiotics is applied to the agricultural area?
708	<p>Precise fertilisation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farm use systems for precise fertilisation (e.g. variable rate application methods, drip irrigation with mineral fertilisers)?
710	<p>Harmful substances P-fertilisers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Does the farm only use mineral P-fertilisers, which comply with the limits of harmful substances (heavy metals and uranium)?
231	<p>No use of synth. chem. herbicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the agricultural area does not receive synthetic chemical herbicide applications?

Indicator number	Indicator name (Relevance)	Indicator description
233	<p>No use of synth. chem. fungicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the agricultural area does not receive synthetic chemical fungicide applications?</p>
234	<p>No use of synth. chem. insecticides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the agricultural area does not receive synthetic chemical insecticide applications? <i>Spinosad, Neem and other broad-range organic insecticides count.</i></p>
377,1	<p>Pesticides: Number of active substances</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>How many active substances of pesticides are used per year?</p>
474,2	<p>Pesticides: Persistence soil</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered to be very persistent in soil (half-life > 180 days) according to the "PAN Pesticide Database"?</p>
740	<p>Growth regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm decline to use synthetic chemical growth regulators?</p>
747	<p>Flowering regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm use products to influence the flowering of plants or for desiccation? <i>Rate positive for nature identical ethylene gas.</i></p>
376,1	<p>Information on water availability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>In case there is a risk of temporary water scarcity, does the farm have access to information on water availability (e.g. groundwater level)?</p>

Indicator number	Indicator name (Relevance)	Indicator description
376,2	<p>Information on water quality</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Does the farm have access to information on water quality (analysis of water quality)?
706	<p>Ebb and flow system</p> <p>Relevant for farms with the following activities: Vegetable production, Pot plants / Plant nursery</p>	Does the farm use indoor ebb and flow production systems (i.e. hydroponics)?
619	<p>Proportion drained arable land on moorland</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	What is the proportion of drained arable land that is on moorland (including peatland, wetland)? <i>Comment: Consider all dewatering measures of the past 20 years</i>
619,1	<p>Proportion drained arable land which is not on moorland</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	What is the proportion of drained arable land that is not on moorland (including peatland, wetland)? <i>Comment: Consider all dewatering measures of the past 20 years (e.g. draining, trenching)</i>
618	<p>Proportion drained permanent grassland on moorland</p> <p>Relevant for farms with the following activities: Permanent grassland, Tropical crops</p>	What is the proportion of drained grassland that is on moorland (including peatland, wetland)? <i>Comment: Consider all dewatering measures of the past 20 years</i>
618,1	<p>Proportion drained permanent grassland which is not on moorland</p> <p>Relevant for farms with the following activities: Permanent grassland, Tropical crops</p>	What is the proportion of drained grassland that is not on moorland (including peatland, wetland)? <i>Comment: Consider all dewatering measures of the past 20 years (e.g. draining, trenching)</i>
608	<p>Use of antibiotic drying agents</p> <p>Relevant for farms with the following activities: Dairy cattle / Goats / Sheep</p>	Does the farm use antibiotic drying agents?

Indicator number	Indicator name (Relevance)	Indicator description
765	<p>Correct waste disposal</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is all operational/commercial waste disposed correctly?</p> <p>Exclude pesticides and veterinary medicines (already covered in ID 327)</p> <p>Consider waste e.g.: <i>Waste oil, used tyres, batteries, plastics, metal, paper/cardboard, glass and other waste</i></p> <p><i>Comment: score positive if waste is collected by public/private services (for e.g. incineration, covered land-fill)</i></p>
327	<p>Waste disposal: pesticides and veterinary medicines</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are all waste materials from plant protection products and veterinary medicines disposed properly?</p> <p><i>Score positive if no such wastes arise</i></p>
334	<p>Recycling of waste oil</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the used oil is delivered to recycling points?</p>
334,1	<p>Recycling of used tyres</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of used tyres is delivered to recycling points?</p>
334,2	<p>Recycling of used batteries</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of used batteries is delivered to recycling points?</p>

Indicator number	Indicator name (Relevance)	Indicator description
334,3	<p>Recycling of plastic waste</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the plastic waste is delivered to recycling points?</p>
738	<p>Production materials: Use of problematic elements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm only use production materials made of less problematic plastic types? <i>Check problematic materials (e.g. PVC, polystyrene)</i></p>
737	<p>Use of synthetic aggregates for soil and substrate</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>Does the farm use synthetic aggregates or chemically treated wood products (e.g. bark mulch) for the substrate?</p>
733	<p>Peat: Usage for seedling production</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>What is the proportion of peat in the substrate used for seedling production?</p>
734	<p>Peat: Usage for further growth</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>What is the proportion of peat in the substrate used for further growth (estimated)?</p>
735	<p>Peat: Usage in grown soil</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>Does the farm use peat in grown soil?</p>

Tab. S21 SMART Indicators for the Sub-Theme “Land Degradation”

Indicator number	Indicator name (Relevance)	Indicator description
222	<p>Permanent grasslands: Share of agricultural area</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Tropical crops</p>	What proportion of the agricultural area is devoted to permanent grassland?
253	<p>Permanent grasslands: Extensively managed</p> <p>Relevant for farms with the following activities: Arable farming, Permanent grassland, Beef cattle, Pig production, Poultry production, Tropical crops</p>	<p>What proportion of the area of permanent grassland is under extensive management?</p> <p>Extensive means: double mowing/grazing or less, zero application of fertilizers / pesticides</p>
764	<p>Share of legumes on perennial crops area</p> <p>Relevant for farms with the following activities: Fruit production, Viticulture, Tree nursery / perennials</p>	What proportion of the perennial crops area is devoted to legumes?
700	<p>Measures to prevent erosion</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>Are sufficient measures taken on agricultural areas (excluding permanent grassland) with sloping gradients lower than 15 % to prevent erosion?</p> <p><i>Consider: cropping techniques, type of crop, gradients, weather conditions (wind, rainfall etc.).</i></p>
705	<p>Substrate (Soiless) production</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>Does the farm have substrate (soiless) production systems?</p> <p><i>Example: substrate, hydroponics.</i></p>
719,1	<p>Poultry: cover of vegetation at open-air access</p> <p>Relevant for farms with the following activities: Poultry production</p>	<p><i>If there is an open-air access for poultry:</i></p> <p>What is the percentage of vegetation coverage of the open-air access?</p> <p><i>Score based on worst poultry access.</i></p>
300	<p>Arable land: Gradients > 15 %</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	What proportion of the arable land has gradients above 15 %?
288	<p>Arable land: Erosion control > 15 %</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Tropical crops</p>	Are sufficient measures taken on agricultural areas (excluding permanent grassland) with sloping gradients higher than 15 % (up to 30%) to prevent erosion (e.g. contour ploughing)?

Indicator number	Indicator name (Relevance)	Indicator description
299	<p>Arable land: Green cover > 30 %</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Care is taken on agricultural areas with sloping gradients higher than 30 % to ensure a good, continuous green cover (under sown crops, catch crops etc.)?
767	<p>Land ownership</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farmer have secure tenure rights over the land for at least 10 years?
257	<p>Arable land: Average plot size</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	What is the average plot size of the farm's arable land?
229	<p>Ecological compensation areas: share of agricultural land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the agricultural area are ecological compensation areas / areas to promote biodiversity?</p> <p><i>Check for documents/evidence that areas are extensively cultivated or not cultivated at all.</i></p>
605	<p>Management of riparian strips</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Are the riparian strips extensively managed (minimum width 3m, no cultivation, no fertilizers, no pesticides)?
244	<p>Number of scattered fruit trees</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	How many scattered fruit trees does the farm have (trees per ha agricultural area)?

Indicator number	Indicator name (Relevance)	Indicator description
202	<p>Agro-forestry systems</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the farm's agricultural area is devoted to agro-forestry systems?
208	<p>Woodlands: Share of agricultural land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the farmland (all area types of the farm) is woodland?
204	<p>Woodlands: Deforestation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Which portion of the farm's current agricultural area has been deforested over the past 20 years?</p> <p><i>Remark: deforestation = removal of a forest or stand of trees were the land is thereafter converted to a non-forest use.</i></p>
236	<p>Number of elements in crop rotation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>How many elements does the crop rotation consist of?</p> <p><i>Count perennial clover grass as one crop</i></p>
215	<p>Arable land: Share of temporary grasslands</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	What proportion of the arable land is devoted to temporary grassland (grass-clover, ley, alfalfa etc.)?
285	<p>Humus Formation: Catch Crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	On what proportion of the arable land are catch crops grown?
225	<p>Arable land: Share of green cover outside growing period</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>What proportion of the arable land is covered by vegetation outside the growing period?</p> <p><i>EU: Period between 15. November und 15. February.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
237	<p>Arable land: Share of mulching</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the arable land is mulched? <i>Leaving only harvest residues on the field doesn't count as mulching (is assessed separately: ID 289).</i></p>
207	<p>Arable land: Share of direct seeding</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>What proportion of the arable land is managed by the method of direct seeding?</p>
219	<p>Arable land: Under sown crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	<p>What proportion of the arable land has cover crops under sown?</p>
601	<p>Permanent grasslands: Conversion</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Viticulture, Tropical crops</p>	<p>What proportion of permanent grasslands has been converted to arable land in the past 5 years?</p>
602	<p>Permanent grasslands: Renewal</p> <p>Relevant for farms with the following activities: Permanent grassland</p>	<p>What proportion of permanent grassland has been newly seeded in the past 5 years?</p>
296	<p>Soil degradation: Share of agricultural area</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Pig production, Poultry production, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the agricultural area has been degraded over the last 20 years or can no longer be used for farming?</p>
743	<p>Sealed areas</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the total farm area is sealed (i.e. concrete, paved)?</p>

Indicator number	Indicator name (Relevance)	Indicator description
286	<p>Soil degradation: Measures taken to counter</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>On what proportion of the agricultural area are measures taken to combat relevant soil degradation processes on the farm (e.g. compaction, pollution)?</p> <p><i>Do not consider erosion (already covered in other indicators), see list of examples, award full points if no degradation processes are evident.</i></p>
281	<p>Soil degradation: Severe soil compaction</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>On what proportion of the agricultural area has been signs of severe soil compaction (caused by either machinery or livestock)?</p>
287	<p>Soil degradation: Compaction due to heavy machinery</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>When heavy machinery is used, are measures taken to reduce wheel load (twin tyres) and surface contact pressure (reduced inflation pressure)?</p>
298	<p>Soil improvement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of formerly degraded lands (not suitable for farming) has been regenerated over the past 20 years and can again be used for farming?</p> <p><i>Measures include e.g. compost applications, liming, fertilizer applications</i></p> <p><i>Full score for completely fertile soils</i></p>
182	<p>Plough less soil management</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the arable land is subject to zero / no-tillage or reduced tillage?</p>
606	<p>Landslides and mudslides on agricultural area</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Tropical crops</p>	<p>Were there landslides and/or local mudslides on the farms agricultural area in the past 10 years?</p>

Indicator number	Indicator name (Relevance)	Indicator description
289	Humus formation: Crop residues Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops	On what proportion of the arable land crop residues (e.g. straw, beet tops) are not removed?
748	Humus Formation: Humus balance Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops	1) Is the humus balance calculated? 2) Is the humus balance positive, balanced or negative on average? <i>In case of small farms, check whether the farmer focuses on practices that improve humus balance</i>
741	Steaming on open ground Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops	1) Is soil steaming performed on open ground? <i>If yes:</i> 2) Is deep or flat steaming performed?
749	Soil disinfection Relevant for farms with the following activities: Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	1) On which proportion of the agricultural area are soil disinfection chemicals (e.g. fumigation) applied? <i>If no:</i> 2) Is documentation and justification for the use of soil disinfection products available?
710	Harmful substances P-fertilisers Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	Does the farm only use mineral P-fertilisers, which comply with the limits of harmful substances (heavy metals and uranium)?
231	No use of synth. chem. herbicides Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	What proportion of the agricultural area does not receive synthetic chemical herbicide applications?
233	No use of synth. chem. fungicides Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops	What proportion of the agricultural area does not receive synthetic chemical fungicide applications?

Indicator number	Indicator name (Relevance)	Indicator description
474,2	<p>Pesticides: Persistence soil</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered to be very persistent in soil (half-life > 180 days) according to the "PAN Pesticide Database"?</p>
706	<p>Ebb and flow system</p> <p>Relevant for farms with the following activities: Vegetable production, Pot plants / Plant nursery</p>	<p>Does the farm use indoor ebb and flow production systems (i.e. hydroponics)?</p>
619	<p>Proportion drained arable land on moorland</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	<p>What is the proportion of drained arable land that is on moorland (including peatland, wetland)?</p> <p><i>Comment: Consider all dewatering measures of the past 20 years</i></p>
619,1	<p>Proportion drained arable land which is not on moorland</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	<p>What is the proportion of drained arable land that is not on moorland (including peatland, wetland)?</p> <p><i>Comment: Consider all dewatering measures of the past 20 years (e.g. draining, trenching)</i></p>
618	<p>Proportion drained permanent grassland on moorland</p> <p>Relevant for farms with the following activities: Permanent grassland, Tropical crops</p>	<p>What is the proportion of drained grassland that is on moorland (including peatland, wetland)?</p> <p><i>Comment: Consider all dewatering measures of the past 20 years</i></p>
618,1	<p>Proportion drained permanent grassland which is not on moorland</p> <p>Relevant for farms with the following activities: Permanent grassland, Tropical crops</p>	<p>What is the proportion of drained grassland that is not on moorland (including peatland, wetland)?</p> <p><i>Comment: Consider all dewatering measures of the past 20 years (e.g. draining, trenching)</i></p>
733	<p>Peat: Usage for seedling production</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>What is the proportion of peat in the substrate used for seedling production?</p>
734	<p>Peat: Usage for further growth</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>What is the proportion of peat in the substrate used for further growth (estimated)?</p>

Indicator number	Indicator name (Relevance)	Indicator description
735	Peat: Usage in grown soil Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery	Does the farm use peat in grown soil?
736	Peat: Origin Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery	Is there a risk that the peat used on the farm comes from proclaimed nature conservation areas or is of doubtful origin ? <i>If the peat is environmentally certified, answer no (labels: RPP, Veriflora).</i>

Tab. S22 SMART Indicators for the Sub-Theme “Ecosystem Diversity”

Indicator number	Indicator name (Relevance)	Indicator description
222	Permanent grasslands: Share of agricultural area Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Tropical crops	What proportion of the agricultural area is devoted to permanent grassland?
253	Permanent grasslands: Extensively managed Relevant for farms with the following activities: Arable farming, Permanent grassland, Beef cattle, Pig production, Poultry production, Tropical crops	What proportion of the area of permanent grassland is under extensive management? Extensive means: double mowing/grazing or less, zero application of fertilizers / pesticides
764	Share of legumes on perennial crops area Relevant for farms with the following activities: Fruit production, Viticulture, Tree nursery / perennials	What proportion of the perennial crops area is devoted to legumes?
705	Substrate (Soilless) production Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery	Does the farm have substrate (soilless) production systems? <i>Example: substrate, hydroponics.</i>

Indicator number	Indicator name (Relevance)	Indicator description
288	<p>Arable land: Erosion control > 15 %</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Tropical crops</p>	<p>Are sufficient measures taken on agricultural areas (excluding permanent grassland) with sloping gradients higher than 15 % (up to 30%) to prevent erosion (e.g. contour ploughing)?</p>
299	<p>Arable land: Green cover > 30 %</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Care is taken on agricultural areas with sloping gradients higher than 30 % to ensure a good, continuous green cover (under sown crops, catch crops etc.)?</p>
257	<p>Arable land: Average plot size</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What is the average plot size of the farm's arable land?</p>
744	<p>On farm Biodiversity promotion</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Are beneficial organisms on the farm protected and promoted?</p>
229	<p>Ecological compensation areas: share of agricultural land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the agricultural area are ecological compensation areas / areas to promote biodiversity?</p> <p><i>Check for documents/evidence that areas are extensively cultivated or not cultivated at all.</i></p>
711	<p>Ecological compensation areas: Valuable landscape elements - Interconnection</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do the farm implement measures on its agricultural area to enhance the interconnection of ecological compensation areas and/or ecological valuable landscape elements?</p> <p><i>If neither ecological compensation areas nor ecological valuable landscape elements existing on the farm's agricultural area, then rate "No".</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
605	<p>Management of riparian strips</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Are the riparian strips extensively managed (minimum width 3m, no cultivation, no fertilizers, no pesticides)?
244	<p>Number of scattered fruit trees</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	How many scattered fruit trees does the farm have (trees per ha agricultural area)?
202	<p>Agro-forestry systems</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the farm's agricultural area is devoted to agro-forestry systems?
208	<p>Woodlands: Share of agricultural land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the farmland (all area types of the farm) is woodland?
204	<p>Woodlands: Deforestation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Which portion of the farm's current agricultural area has been deforested over the past 20 years?</p> <p><i>Remark: deforestation = removal of a forest or stand of trees were the land is thereafter converted to a non-forest use.</i></p>
236	<p>Number of elements in crop rotation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>How many elements does the crop rotation consist of?</p> <p><i>Count perennial clover grass as one crop</i></p>
758	<p>Number of perennial crops</p> <p>Relevant for farms with the following activities: Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>How many different perennial crops are grown on the farm's agricultural area?</p> <p><i>Count perennial crops if more than 10% of agricultural area.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
215	Arable land: Share of temporary grasslands Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops	What proportion of the arable land is devoted to temporary grassland (grass-clover, ley, alfalfa etc.)?
285	Humus Formation: Catch Crops Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops	On what proportion of the arable land are catch crops grown?
225	Arable land: Share of green cover outside growing period Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery	What proportion of the arable land is covered by vegetation outside the growing period? <i>EU: Period between 15. November und 15. February.</i>
237	Arable land: Share of mulching Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops	What proportion of the arable land is mulched? <i>Leaving only harvest residues on the field doesn't count as mulching (is assessed separately: ID 289).</i>
219	Arable land: Under sown crops Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops	What proportion of the arable land has cover crops under sown?
601	Permanent grasslands: Conversion Relevant for farms with the following activities: Arable farming, Vegetable production, Viticulture, Tropical crops	What proportion of permanent grasslands has been converted to arable land in the past 5 years?
620	Permanent grasslands: Mowing frequency Relevant for farms with the following activities: Permanent grassland	How often is the grassland mowed on average?
743	Sealed areas Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	What proportion of the total farm area is sealed (i.e. concrete, paved)?

Indicator number	Indicator name (Relevance)	Indicator description
301	<p>Contamination tests before using bought-in fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>Only in cases, in which external organic fertilizers are applied (e.g. compost, sewage, sludge):</i></p> <p>Are only substances applied (e.g. composts, sewage sludge, wastewater) that have been tested for contamination beforehand (primarily heavy metals, antibiotics) and found to be safe?</p> <p><i>Rate positive if fertilizers from other organic farms are applied.</i></p>
289	<p>Humus formation: Crop residues</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>On what proportion of the arable land crop residues (e.g. straw, beet tops) are not removed?</p>
749	<p>Soil disinfection</p> <p>Relevant for farms with the following activities: Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>1) On which proportion of the agricultural area are soil disinfection chemicals (e.g. fumigation) applied? <i>If no:</i></p> <p>2) Is documentation and justification for the use of soil disinfection products available?</p>
323	<p>Mineral N fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What is the farm's mineral N fertilizer (in kg) usage per hectare per year on its agricultural area?</p>
324	<p>Mineral P fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What is the farm's total easily dissolvable mineral P fertilizer usage (P₂O₅ in kg) per hectare per year (active P ingredients) on its agricultural area?</p>
231	<p>No use of synth. chem. herbicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the agricultural area does not receive synthetic chemical herbicide applications?</p>

Indicator number	Indicator name (Relevance)	Indicator description
233	<p>No use of synth. chem. fungicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the agricultural area does not receive synthetic chemical fungicide applications?</p>
234	<p>No use of synth. chem. insecticides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the agricultural area does not receive synthetic chemical insecticide applications? <i>Spinosad, Neem and other broad-range organic insecticides count.</i></p>
257,2	<p>Pesticides: Toxicity aquatic organisms</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered to be toxic to aquatic organisms according to the "PAN Pesticide Database"? <i>The strongest impact on organisms of all active ingredients used is assessed</i></p>
257,1	<p>Pesticides: Toxicity bees</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered toxic to bees according to the "PAN Pesticide Database"? <i>The strongest impact on bees of all active ingredients used is assessed</i></p>
740	<p>Growth regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm decline to use synthetic chemical growth regulators?</p>
747	<p>Flowering regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm use products to influence the flowering of plants or for desiccation? <i>Rate positive for nature identical ethylene gas.</i></p>
619	<p>Proportion drained arable land on moorland</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	<p>What is the proportion of drained arable land that is on moorland (including peatland, wetland)? <i>Comment: Consider all dewatering measures of the past 20 years</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
618	<p>Proportion drained permanent grassland on moorland</p> <p>Relevant for farms with the following activities: Permanent grassland, Tropical crops</p>	<p>What is the proportion of drained grassland that is on moorland (including peatland, wetland)?</p> <p><i>Comment: Consider all dewatering measures of the past 20 years</i></p>
227	<p>Alpine pasturage and shepherding</p> <p>Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep</p>	<p>What proportion of the livestock is moved to alpine pasture in the summer?</p> <p><i>Do not answer question if in a region with no alpine pasture.</i></p>
371	<p>Access to pasture: Months per year</p> <p>Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep</p>	<p>How many days per year are the ruminants out on pasture?</p> <p>Ask for summer and winter separately</p>
733	<p>Peat: Usage for seedling production</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>What is the proportion of peat in the substrate used for seedling production?</p>
734	<p>Peat: Usage for further growth</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>What is the proportion of peat in the substrate used for further growth (estimated)?</p>
735	<p>Peat: Usage in grown soil</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>Does the farm use peat in grown soil?</p>
736	<p>Peat: Origin</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>Is there a risk that the peat used on the farm comes from proclaimed nature conservation areas or is of doubtful origin?</p> <p><i>If the peat is environmentally certified, answer no (labels: RPP, Veriflora).</i></p>

Tab. S23

SMART Indicators for the Sub-Theme "Species Diversity"

Indicator number	Indicator name (Relevance)	Indicator description
222	<p>Permanent grasslands: Share of agricultural area</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Tropical crops</p>	What proportion of the agricultural area is devoted to permanent grassland?
253	<p>Permanent grasslands: Extensively managed</p> <p>Relevant for farms with the following activities: Arable farming, Permanent grassland, Beef cattle, Pig production, Poultry production, Tropical crops</p>	<p>What proportion of the area of permanent grassland is under extensive management?</p> <p>Extensive means: double mowing/grazing or less, zero application of fertilizers / pesticides</p>
764	<p>Share of legumes on perennial crops area</p> <p>Relevant for farms with the following activities: Fruit production, Viticulture, Tree nursery / perennials</p>	What proportion of the perennial crops area is devoted to legumes?
700	<p>Measures to prevent erosion</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>Are sufficient measures taken on agricultural areas (excluding permanent grassland) with sloping gradients lower than 15 % to prevent erosion?</p> <p><i>Consider: cropping techniques, type of crop, gradients, weather conditions (wind, rainfall etc.).</i></p>
705	<p>Substrate (Soiless) production</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>Does the farm have substrate (soiless) production systems?</p> <p><i>Example: substrate, hydroponics.</i></p>
288	<p>Arable land: Erosion control > 15 %</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Tropical crops</p>	Are sufficient measures taken on agricultural areas (excluding permanent grassland) with sloping gradients higher than 15 % (up to 30%) to prevent erosion (e.g. contour ploughing)?
299	<p>Arable land: Green cover > 30 %</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Care is taken on agricultural areas with sloping gradients higher than 30 % to ensure a good, continuous green cover (under sown crops, catch crops etc.)?

Indicator number	Indicator name (Relevance)	Indicator description
257	<p>Arable land: Average plot size</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	What is the average plot size of the farm's arable land?
744	<p>On farm Biodiversity promotion</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Are beneficial organisms on the farm protected and promoted?
229	<p>Ecological compensation areas: share of agricultural land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the agricultural area are ecological compensation areas / areas to promote biodiversity?</p> <p><i>Check for documents/evidence that areas are extensively cultivated or not cultivated at all.</i></p>
711	<p>Ecological compensation areas: Valuable landscape elements - Interconnection</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do the farm implement measures on its agricultural area to enhance the interconnection of ecological compensation areas and/or ecological valuable landscape elements?</p> <p><i>If neither ecological compensation areas nor ecological valuable landscape elements existing on the farm's agricultural area, then rate "No".</i></p>
605	<p>Management of riparian strips</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Are the riparian strips extensively managed (minimum width 3m, no cultivation, no fertilizers, no pesticides)?
244	<p>Number of scattered fruit trees</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	How many scattered fruit trees does the farm have (trees per ha agricultural area)?

Indicator number	Indicator name (Relevance)	Indicator description
202	<p>Agro-forestry systems</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the farm's agricultural area is devoted to agro-forestry systems?
208	<p>Woodlands: Share of agricultural land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the farmland (all area types of the farm) is woodland?
204	<p>Woodlands: Deforestation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Which portion of the farm's current agricultural area has been deforested over the past 20 years?</p> <p><i>Remark: deforestation = removal of a forest or stand of trees were the land is thereafter converted to a non-forest use.</i></p>
236	<p>Number of elements in crop rotation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>How many elements does the crop rotation consist of?</p> <p><i>Count perennial clover grass as one crop</i></p>
758	<p>Number of perennial crops</p> <p>Relevant for farms with the following activities: Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>How many different perennial crops are grown on the farm's agricultural area?</p> <p><i>Count perennial crops if more than 10% of agricultural area.</i></p>
215	<p>Arable land: Share of temporary grasslands</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	What proportion of the arable land is devoted to temporary grassland (grass-clover, ley, alfalfa etc.)?
285	<p>Humus Formation: Catch Crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	On what proportion of the arable land are catch crops grown?

Indicator number	Indicator name (Relevance)	Indicator description
225	<p>Arable land: Share of green cover outside growing period</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>What proportion of the arable land is covered by vegetation outside the growing period?</p> <p><i>EU: Period between 15. November und 15. February.</i></p>
237	<p>Arable land: Share of mulching</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the arable land is mulched?</p> <p><i>Leaving only harvest residues on the field doesn't count as mulching (is assessed separately: ID 289).</i></p>
207	<p>Arable land: Share of direct seeding</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>What proportion of the arable land is managed by the method of direct seeding?</p>
219	<p>Arable land: Under sown crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	<p>What proportion of the arable land has cover crops under sown?</p>
620	<p>Permanent grasslands: Mowing frequency</p> <p>Relevant for farms with the following activities: Permanent grassland</p>	<p>How often is the grassland mowed on average?</p>
743	<p>Sealed areas</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the total farm area is sealed (i.e. concrete, paved)?</p>
286	<p>Soil degradation: Measures taken to counter</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>On what proportion of the agricultural area are measures taken to combat relevant soil degradation processes on the farm (e.g. compaction, pollution)?</p> <p><i>Do not consider erosion (already covered in other indicators), see list of examples, award full points if no degradation processes are evident.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
182	<p>Plough less soil management</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the arable land is subject to zero / no-tillage or reduced tillage?</p>
301	<p>Contamination tests before using bought-in fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>Only in cases, in which external organic fertilizers are applied (e.g. compost, sewage, sludge):</i></p> <p>Are only substances applied (e.g. composts, sewage sludge, wastewater) that have been tested for contamination beforehand (primarily heavy metals, antibiotics) and found to be safe?</p> <p><i>Rate positive if fertilizers from other organic farms are applied.</i></p>
289	<p>Humus formation: Crop residues</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>On what proportion of the arable land crop residues (e.g. straw, beet tops) are not removed?</p>
748	<p>Humus Formation: Humus balance</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	<p>1) Is the humus balance calculated?</p> <p>2) Is the humus balance positive, balanced or negative on average? <i>In case of small farms, check whether the farmer focuses on practices that improve humus balance</i></p>
741	<p>Steaming on open ground</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>1) Is soil steaming performed on open ground?</p> <p><i>If yes:</i></p> <p>2) Is deep or flat steaming performed?</p>
742	<p>Steaming in the greenhouse</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>1) Is soil steaming performed in the greenhouse?</p> <p><i>If yes:</i></p> <p>2) Is deep or flat steaming performed?</p>
749	<p>Soil disinfection</p> <p>Relevant for farms with the following activities: Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>1) On which proportion of the agricultural area are soil disinfection chemicals (e.g. fumigation) applied?</p> <p><i>If no:</i></p> <p>2) Is documentation and justification for the use of soil disinfection products available?</p>

Indicator number	Indicator name (Relevance)	Indicator description
290	<p>Determining fertilizer requirements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When determining fertilizer requirements, are soil analysis results and/or leaf-analysis considered?</p> <p><i>Soil analyses: Once every 5 years: pH, P and K / Annually: Nmin</i></p>
323	<p>Mineral N fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What is the farm's mineral N fertilizer (in kg) usage per hectare per year on its agricultural area?</p>
324	<p>Mineral P fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What is the farm's total easily dissolvable mineral P fertilizer usage (P₂O₅ in kg) per hectare per year (active P ingredients) on its agricultural area?</p>
308	<p>Farmyard manure</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion (volume) of the organic fertilizer used is farmyard manure?</p>
309	<p>Compost</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the organic fertilizer used is compost (plant-based or livestock-based)?</p>
295	<p>Antibiotics from livestock in fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that manure/slurry from livestock treated with antibiotics is applied to the agricultural area?</p>
708	<p>Precise fertilisation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm use systems for precise fertilisation (e.g. variable rate application methods, drip irrigation with mineral fertilisers)?</p>

Indicator number	Indicator name (Relevance)	Indicator description
710	<p>Harmful substances P-fertilisers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Does the farm only use mineral P-fertilisers, which comply with the limits of harmful substances (heavy metals and uranium)?
231	<p>No use of synth. chem. herbicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the agricultural area does not receive synthetic chemical herbicide applications?
233	<p>No use of synth. chem. fungicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	What proportion of the agricultural area does not receive synthetic chemical fungicide applications?
234	<p>No use of synth. chem. insecticides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	What proportion of the agricultural area does not receive synthetic chemical insecticide applications? <i>Spinosad, Neem and other broad-range organic insecticides count.</i>
377,1	<p>Pesticides: Number of active substances</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	How many active substances of pesticides are used per year?
257,2	<p>Pesticides: Toxicity aquatic organisms</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Pesticides: Are active substances used, which are considered to be toxic to aquatic organisms according to the "PAN Pesticide Database"? <i>The strongest impact on organisms of all active ingredients used is assessed</i>

Indicator number	Indicator name (Relevance)	Indicator description
257,1	<p>Pesticides: Toxicity bees</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered toxic to bees according to the "PAN Pesticide Database"?</p> <p><i>The strongest impact on bees of all active ingredients used is assessed</i></p>
474,1	<p>Pesticides: Persistence water</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered very persistent in water (half-life > 60 days) according to the "PAN Pesticide Database"?</p>
474,2	<p>Pesticides: Persistence soil</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered to be very persistent in soil (half-life > 180 days) according to the "PAN Pesticide Database"?</p>
377,5	<p>Pesticides: Chronic toxicity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered to have adverse long term effects on the users according to the "PAN List of HHPs" or "PAN Pesticide Database"?</p>
377,75	<p>Pesticides: Acute toxicity inhalation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered acute toxic when inhaled by the users according to the "Globally Harmonized System of Classification (GHS)"?</p>
377,7	<p>Pesticides: Acute toxicity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are active substances used, which are classified by the WHO as acute toxic to the health of the users?</p>
740	<p>Growth regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm decline to use synthetic chemical growth regulators?</p>

Indicator number	Indicator name (Relevance)	Indicator description
747	Flowering regulation Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops	Does the farm use products to influence the flowering of plants or for desiccation? <i>Rate positive for nature identical ethylene gas.</i>
389	Irrigation: Water consumption per ha Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops	How much water (in m3 per ha) is used annually for irrigation purposes on the farm?
619	Proportion drained arable land on moorland Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops	What is the proportion of drained arable land that is on moorland (including peatland, wetland)? <i>Comment: Consider all dewatering measures of the past 20 years</i>
618	Proportion drained permanent grassland on moorland Relevant for farms with the following activities: Permanent grassland, Tropical crops	What is the proportion of drained grassland that is on moorland (including peatland, wetland)? <i>Comment: Consider all dewatering measures of the past 20 years</i>
198	Dual-purpose breeds: Ruminants Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	What proportion of the ruminants are dual-purpose breeds? <i>Any dual-purpose breed that is only kept for one purpose (e.g. meat only/dairy only) does not count as a dual-purpose breed.</i>
198,1	Dual-purpose breeds: chickens Relevant for farms with the following activities: Poultry production	What proportion of the chickens are dual-purpose breeds? <i>Any dual-purpose breed that is only kept for one purpose (e.g. meat only/eggs only) does not count as a dual-purpose breed.</i>
227	Alpine pasturage and shepherding Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	What proportion of the livestock is moved to alpine pasture in the summer? <i>Do not answer question if in a region with no alpine pasture.</i>
371	Access to pasture: Months per year Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	How many days per year are the ruminants out on pasture? Ask for summer and winter separately

Indicator number	Indicator name (Relevance)	Indicator description
192	<p>Plants for energy production instead of human consumption</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If a farm uses plant materials for energy production:</i> What part of the substrate used for energy production would also be suitable for human consumption?</p>
519	<p>Use of GMO-crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Is there a risk that GMO crops are grown at the farm?
34	<p>Use of GMO-feedstuff</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is there a risk that the farm is using GMO feedstuff?
737	<p>Use of synthetic aggregates for soil and substrate</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	Does the farm use synthetic aggregates or chemically treated wood products (e.g. bark mulch) for the substrate?
733	<p>Peat: Usage for seedling production</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	What is the proportion of peat in the substrate used for seedling production ?
734	<p>Peat: Usage for further growth</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	What is the proportion of peat in the substrate used for further growth (estimated)?
735	<p>Peat: Usage in grown soil</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	Does the farm use peat in grown soil?

Indicator number	Indicator name (Relevance)	Indicator description
736	<p>Peat: Origin</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>Is there a risk that the peat used on the farm comes from proclaimed nature conservation areas or is of doubtful origin?</p> <p><i>If the peat is environmentally certified, answer no (labels: RPP, Veriflora).</i></p>

Tab. S24 SMART Indicators for the Sub-Theme “Genetic Diversity”

Indicator number	Indicator name (Relevance)	Indicator description
222	<p>Permanent grasslands: Share of agricultural area</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Tropical crops</p>	<p>What proportion of the agricultural area is devoted to permanent grassland?</p>
253	<p>Permanent grasslands: Extensively managed</p> <p>Relevant for farms with the following activities: Arable farming, Permanent grassland, Beef cattle, Pig production, Poultry production, Tropical crops</p>	<p>What proportion of the area of permanent grassland is under extensive management?</p> <p>Extensive means: double mowing/grazing or less, zero application of fertilizers / pesticides</p>
229	<p>Ecological compensation areas: share of agricultural land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the agricultural area are ecological compensation areas / areas to promote biodiversity?</p> <p><i>Check for documents/evidence that areas are extensively cultivated or not cultivated at all.</i></p>
711	<p>Ecological compensation areas: Valuable landscape elements - Interconnection</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do the farm implement measures on its agricultural area to enhance the interconnection of ecological compensation areas and/or ecological valuable landscape elements?</p> <p><i>If neither ecological compensation areas nor ecological valuable landscape elements existing on the farm’s agricultural area, then rate “No”.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
244	<p>Number of scattered fruit trees</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	How many scattered fruit trees does the farm have (trees per ha agricultural area)?
202	<p>Agro-forestry systems</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the farm's agricultural area is devoted to agro-forestry systems?
208	<p>Woodlands: Share of agricultural land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the farmland (all area types of the farm) is woodland?
236	<p>Number of elements in crop rotation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>How many elements does the crop rotation consist of?</p> <p><i>Count perennial clover grass as one crop</i></p>
620	<p>Permanent grasslands: Mowing frequency</p> <p>Relevant for farms with the following activities: Permanent grassland</p>	How often is the grassland mowed on average?
743	<p>Sealed areas</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the total farm area is sealed (i.e. concrete, paved)?
741	<p>Steaming on open ground</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>1) Is soil steaming performed on open ground?</p> <p><i>If yes:</i></p> <p>2) Is deep or flat steaming performed?</p>

Indicator number	Indicator name (Relevance)	Indicator description
749	<p>Soil disinfection</p> <p>Relevant for farms with the following activities: Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>1) On which proportion of the agricultural area are soil disinfection chemicals (e.g. fumigation) applied? <i>If no:</i></p> <p>2) Is documentation and justification for the use of soil disinfection products available?</p>
223	<p>Rare or endangered agricultural crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>How many rare or endangered agricultural crops are grown on the farm? <i>Including crop species and cultivars.</i></p>
247	<p>Hybrid cultivars</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Permanent grassland, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm decline to cultivate hybrid cultivars?</p>
233	<p>No use of synth. chem. fungicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the agricultural area does not receive synthetic chemical fungicide applications?</p>
234	<p>No use of synth. chem. insecticides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the agricultural area does not receive synthetic chemical insecticide applications? <i>Spinosad, Neem and other broad-range organic insecticides count.</i></p>
377,1	<p>Pesticides: Number of active substances</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>How many active substances of pesticides are used per year?</p>
257,1	<p>Pesticides: Toxicity bees</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered toxic to bees according to the "PAN Pesticide Database"? <i>The strongest impact on bees of all active ingredients used is assessed</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
198	<p>Dual-purpose breeds: Ruminants</p> <p>Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep</p>	<p>What proportion of the ruminants are dual-purpose breeds?</p> <p><i>Any dual-purpose breed that is only kept for one purpose (e.g. meat only/dairy only) does not count as a dual-purpose breed.</i></p>
198,1	<p>Dual-purpose breeds: chickens</p> <p>Relevant for farms with the following activities: Poultry production</p>	<p>What proportion of the chickens are dual-purpose breeds?</p> <p><i>Any dual-purpose breed that is only kept for one purpose (e.g. meat only/eggs only) does not count as a dual-purpose breed.</i></p>
245	<p>Locally adapted livestock breeds</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Are locally adapted livestock breeds kept on the farm?</p>
246	<p>Rare and endangered livestock breeds</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Are rare or endangered livestock breeds kept on the farm?</p>
249	<p>Hybrid livestock (poultry, pigs)</p> <p>Relevant for farms with the following activities: Pig production, Poultry production, Bees, Aquaculture</p>	<p>Does the farm keep hybrid livestock (of poultry or pigs)?</p>
192	<p>Plants for energy production instead of human consumption</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If a farm uses plant materials for energy production:</i></p> <p>What part of the substrate used for energy production would also be suitable for human consumption?</p>
519	<p>Use of GMO-crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Is there a risk that GMO crops are grown at the farm?</p>

Indicator number	Indicator name (Relevance)	Indicator description
34	<p>Use of GMO-feedstuff</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is there a risk that the farm is using GMO feedstuff?

Tab. S25 SMART Indicators for the Sub-Theme “Material Use”

Indicator number	Indicator name (Relevance)	Indicator description
253	<p>Permanent grasslands: Extensively managed</p> <p>Relevant for farms with the following activities: Arable farming, Permanent grassland, Beef cattle, Pig production, Poultry production, Tropical crops</p>	<p>What proportion of the area of permanent grassland is under extensive management?</p> <p>Extensive means: double mowing/grazing or less, zero application of fertilizers / pesticides</p>
206	<p>Share of legumes on arable land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Pot plants / Plant nursery, Tropical crops</p>	What proportion of the arable land is devoted to leguminous crops?
764	<p>Share of legumes on perennial crops area</p> <p>Relevant for farms with the following activities: Fruit production, Viticulture, Tree nursery / perennials</p>	What proportion of the perennial crops area is devoted to legumes?
712	<p>Bought-in organic fertilisers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>What proportion of the entire organic fertilisers used is externally sourced?</p> <p><i>In the past 5 years - average per year?</i></p> <p><i>Green manure not counted in calculation</i></p>
199	<p>Bought-in concentrated feed</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	What proportion of the concentrate feed used on the farm is sourced externally?
288	<p>Arable land: Erosion control > 15 %</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Tropical crops</p>	Are sufficient measures taken on agricultural areas (excluding permanent grassland) with sloping gradients higher than 15 % (up to 30%) to prevent erosion (e.g. contour ploughing)?

Indicator number	Indicator name (Relevance)	Indicator description
299	<p>Arable land: Green cover > 30 %</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Care is taken on agricultural areas with sloping gradients higher than 30 % to ensure a good, continuous green cover (under sown crops, catch crops etc.)?
257	<p>Arable land: Average plot size</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	What is the average plot size of the farm's arable land?
521	<p>Production of bioenergy crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tropical crops</p>	On what proportion of the farm's agricultural area bioenergy crops are produced?
285	<p>Humus Formation: Catch Crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	On what proportion of the arable land are catch crops grown?
225	<p>Arable land: Share of green cover outside growing period</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>What proportion of the arable land is covered by vegetation outside the growing period?</p> <p><i>EU: Period between 15. November und 15. February.</i></p>
207	<p>Arable land: Share of direct seeding</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	What proportion of the arable land is managed by the method of direct seeding?
602	<p>Permanent grasslands: Renewal</p> <p>Relevant for farms with the following activities: Permanent grassland</p>	What proportion of permanent grassland has been newly seeded in the past 5 years?

Indicator number	Indicator name (Relevance)	Indicator description
286	<p>Soil degradation: Measures taken to counter</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>On what proportion of the agricultural area are measures taken to combat relevant soil degradation processes on the farm (e.g. compaction, pollution)?</p> <p><i>Do not consider erosion (already covered in other indicators), see list of examples, award full points if no degradation processes are evident.</i></p>
182	<p>Plough less soil management</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the arable land is subject to zero / no-tillage or reduced tillage?</p>
289	<p>Humus formation: Crop residues</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>On what proportion of the arable land crop residues (e.g. straw, beet tops) are not removed?</p>
748	<p>Humus Formation: Humus balance</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	<p>1) Is the humus balance calculated? 2) Is the humus balance positive, balanced or negative on average? <i>In case of small farms, check whether the farmer focuses on practices that improve humus balance</i></p>
290	<p>Determining fertilizer requirements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When determining fertilizer requirements, are soil analysis results and/or leaf-analysis considered?</p> <p><i>Soil analyses: Once every 5 years: pH, P and K / Annually: Nmin</i></p>
324	<p>Mineral P fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What is the farm's total easily dissolvable mineral P fertilizer usage (P₂O₅ in kg) per hectare per year (active P ingredients) on its agricultural area?</p>
322	<p>Mineral K fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is mineral Potassium fertilizer used in a needs-oriented way on the farm's agricultural area?</p> <p><i>Rate "needs-oriented" if Potassium fertilizer isn't applied with good reason and if there is at the same time no Potassium deficiency.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
708	<p>Precise fertilisation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farm use systems for precise fertilisation (e.g. variable rate application methods, drip irrigation with mineral fertilisers)?
231	<p>No use of synth. chem. herbicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the agricultural area does not receive synthetic chemical herbicide applications?
233	<p>No use of synth. chem. fungicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	What proportion of the agricultural area does not receive synthetic chemical fungicide applications?
234	<p>No use of synth. chem. insecticides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	What proportion of the agricultural area does not receive synthetic chemical insecticide applications? <i>Spinosad, Neem and other broad-range organic insecticides count.</i>
740	<p>Growth regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farm decline to use synthetic chemical growth regulators ?
747	<p>Flowering regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farm use products to influence the flowering of plants or for desiccation ? <i>Rate positive for nature identical ethylene gas.</i>
383	<p>Annual water consumption per ha (entire farm)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture</p>	How much water is consumed on the farm per hectare per year? <i>If own water spring: Let the amount be assessed and add it.</i>

Indicator number	Indicator name (Relevance)	Indicator description
398	<p>Use of non-renewable (fossil) water resources</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is there a risk that water from non-renewable (fossil) water resources is used on the farm?
389	<p>Irrigation: Water consumption per ha</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	How much water (in m3 per ha) is used annually for irrigation purposes on the farm?
399	<p>Use of rainwater</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the farms water consumption is provided by collected rainwater?
404	<p>Irrigation: Precipitation measurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Is precipitation measured and recorded with a view to calculating irrigation quantities, taking into account local evapotranspiration rates?
387	<p>Water use efficiency</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery</p>	Are techniques applied to improve water use efficiency?
405	<p>Water storage capacity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Do sufficient capacities exist for water storage on the farm (retention basins, cisterns)?

Indicator number	Indicator name (Relevance)	Indicator description
337	<p>Loss of agricultural products (food waste)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture, Tropical crops</p>	On average, what proportion of the food produced on the farm had to be disposed of over the past 5 years?
198	<p>Dual-purpose breeds: Ruminants</p> <p>Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep</p>	<p>What proportion of the ruminants are dual-purpose breeds?</p> <p><i>Any dual-purpose breed that is only kept for one purpose (e.g. meat only/dairy only) does not count as a dual-purpose breed.</i></p>
198,1	<p>Dual-purpose breeds: chickens</p> <p>Relevant for farms with the following activities: Poultry production</p>	<p>What proportion of the chickens are dual-purpose breeds?</p> <p><i>Any dual-purpose breed that is only kept for one purpose (e.g. meat only/eggs only) does not count as a dual-purpose breed.</i></p>
245	<p>Locally adapted livestock breeds</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	Are locally adapted livestock breeds kept on the farm?
249	<p>Hybrid livestock (poultry, pigs)</p> <p>Relevant for farms with the following activities: Pig production, Poultry production, Bees, Aquaculture</p>	Does the farm keep hybrid livestock (of poultry or pigs)?
358	<p>Cattle: Losses</p> <p>Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep</p>	How high was the loss of cows/beef in the past year?
358,1	<p>Poultry: Losses</p> <p>Relevant for farms with the following activities: Poultry production</p>	<p>How high was average monthly loss of poultry in the past year?</p> <p><i>Score based on poultry category with highest loss rate</i></p>
517	<p>Feed No Food: grazing livestock</p> <p>Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep</p>	What proportion of the feed given to grazing livestock would be suitable for human consumption (For maize silage take standard yields for grain maize)?

Indicator number	Indicator name (Relevance)	Indicator description
518	<p>Feed No Food: non-grazing animals</p> <p>Relevant for farms with the following activities: Pig production, Poultry production, Aquaculture</p>	<p>What proportion of the feed given to non-grazing animals would be suitable for human consumption?</p> <p><i>Contrary to e.g. waste products</i></p> <p><i>Score based on worst animal category</i></p>
765	<p>Correct waste disposal</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is all operational/commercial waste disposed correctly?</p> <p>Exclude pesticides and veterinary medicines (already covered in ID 327)</p> <p>Consider waste e.g.: <i>Waste oil, used tyres, batteries, plastics, metal, paper/cardboard, glass and other waste</i></p> <p><i>Comment: score positive if waste is collected by public/private services (for e.g. incineration, covered land-fill)</i></p>
335,1	<p>Recycling of paper/cardboards</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of paper and cardboard is delivered to recycling points?</p>
334	<p>Recycling of waste oil</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the used oil is delivered to recycling points?</p>
334,1	<p>Recycling of used tyres</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of used tyres is delivered to recycling points?</p>

Indicator number	Indicator name (Relevance)	Indicator description
334,2	<p>Recycling of used batteries</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of used batteries is delivered to recycling points?
334,3	<p>Recycling of plastic waste</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the plastic waste is delivered to recycling points?
334,4	<p>Recycling of metal waste</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the metal waste is delivered to recycling points?
334,5	<p>Recycling of waste glass</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the waste glass is delivered to recycling points?
739	<p>Reusable packaging materials</p> <p>Relevant for farms with the following activities: Vegetable production, Fruit production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>Does the farm use reusable and multiple-use packaging?</p> <p><i>Consider buying and selling.</i></p>
519	<p>Use of GMO-crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Is there a risk that GMO crops are grown at the farm?

Indicator number	Indicator name (Relevance)	Indicator description
34	<p>Use of GMO-feedstuff</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is there a risk that the farm is using GMO feedstuff?
4	<p>Environmental responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they have an environmental certificate?</p> <p><i>Inputs to consider: Feedstuffs, Mineral fertilisers, organic fertilisers (if bought in).</i></p> <p><i>Assess based on the labels (e.g. organic label).</i></p>
162	<p>Procurement < 50 km</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>What proportion of externally sourced feed comes from within 50 km of the farm?</p> <p><i>In cases in which the origin of feed is unknown add it to ID164 (Procurement > 500 km).</i></p> <p><i>This refers to the original source of the inputs, not the point of sale.</i></p>
164	<p>Procurement > 500 km</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>What proportion of externally sourced feed comes from more than 500 km from the farm?</p> <p><i>All feed with unknown origin is added to this indicator.</i></p> <p><i>This refers to the original source of the inputs, not the point of sale.</i></p>
737	<p>Use of synthetic aggregates for soil and substrate</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	Does the farm use synthetic aggregates or chemically treated wood products (e.g. bark mulch) for the substrate?
733	<p>Peat: Usage for seedling production</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	What is the proportion of peat in the substrate used for seedling production ?
734	<p>Peat: Usage for further growth</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	What is the proportion of peat in the substrate used for further growth (estimated)?

Indicator number	Indicator name (Relevance)	Indicator description
735	Peat: Usage in grown soil Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery	Does the farm use peat in grown soil?
736	Peat: Origin Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery	Is there a risk that the peat used on the farm comes from proclaimed nature conservation areas or is of doubtful origin ? <i>If the peat is environmentally certified, answer no (labels: RPP, Veriflora).</i>
63	Proportion of environmentally certified products Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	What proportion of sales products is certified to carry an ecolabel? <i>All environmental labels are valid that are recommended from WWF (2010): http://assets.wwf.ch/downloads/hintergrundbericht_1_abelratgeber_2010_def_low.pdf.</i>

Tab. S26 SMART Indicators for the Sub-Theme “Energy Use”

Indicator number	Indicator name (Relevance)	Indicator description
253	Permanent grasslands: Extensively managed Relevant for farms with the following activities: Arable farming, Permanent grassland, Beef cattle, Pig production, Poultry production, Tropical crops	What proportion of the area of permanent grassland is under extensive management? Extensive means: double mowing/grazing or less, zero application of fertilizers / pesticides
206	Share of legumes on arable land Relevant for farms with the following activities: Arable farming, Vegetable production, Pot plants / Plant nursery, Tropical crops	What proportion of the arable land is devoted to leguminous crops?
764	Share of legumes on perennial crops area Relevant for farms with the following activities: Fruit production, Viticulture, Tree nursery / perennials	What proportion of the perennial crops area is devoted to legumes?

Indicator number	Indicator name (Relevance)	Indicator description
712	<p>Bought-in organic fertilisers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>What proportion of the entire organic fertilisers used is externally sourced?</p> <p><i>In the past 5 years - average per year?</i></p> <p><i>Green manure not counted in calculation</i></p>
199	<p>Bought-in concentrated feed</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>What proportion of the concentrate feed used on the farm is sourced externally?</p>
705	<p>Substrate (Soiless) production</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>Does the farm have substrate (soiless) production systems?</p> <p><i>Example: substrate, hydroponics.</i></p>
719,1	<p>Poultry: cover of vegetation at open-air access</p> <p>Relevant for farms with the following activities: Poultry production</p>	<p><i>If there is an open-air access for poultry:</i></p> <p>What is the percentage of vegetation coverage of the open-air access?</p> <p><i>Score based on worst poultry access.</i></p>
341	<p>Settings of combustion motors</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How often are the settings of combustion motors of vehicles (e.g. tractor, stapler) and other machineries checked and adjusted (engine, air filter etc.)?</p> <p>e.g.: based on exhaust emissions test results</p> <p>If no tractor is use give highest score.</p>
186	<p>On-farm renewable energy production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the electricity consumed is generated by the farm's own installations that are run with renewable sources?</p>
300	<p>Arable land: Gradients > 15 %</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the arable land has gradients above 15 %?</p>
288	<p>Arable land: Erosion control > 15 %</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Tropical crops</p>	<p>Are sufficient measures taken on agricultural areas (excluding permanent grassland) with sloping gradients higher than 15 % (up to 30%) to prevent erosion (e.g. contour ploughing)?</p>

Indicator number	Indicator name (Relevance)	Indicator description
299	<p>Arable land: Green cover > 30 %</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Care is taken on agricultural areas with sloping gradients higher than 30 % to ensure a good, continuous green cover (under sown crops, catch crops etc.)?
257	<p>Arable land: Average plot size</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	What is the average plot size of the farm's arable land?
229	<p>Ecological compensation areas: share of agricultural land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the agricultural area are ecological compensation areas / areas to promote biodiversity?</p> <p><i>Check for documents/evidence that areas are extensively cultivated or not cultivated at all.</i></p>
244	<p>Number of scattered fruit trees</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	How many scattered fruit trees does the farm have (trees per ha agricultural area)?
202	<p>Agro-forestry systems</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the farm's agricultural area is devoted to agro-forestry systems?
204	<p>Woodlands: Deforestation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Which portion of the farm's current agricultural area has been deforested over the past 20 years?</p> <p><i>Remark: deforestation = removal of a forest or stand of trees were the land is thereafter converted to a non-forest use.</i></p>
521	<p>Production of bioenergy crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tropical crops</p>	On what proportion of the farm's agricultural area bioenergy crops are produced?

Indicator number	Indicator name (Relevance)	Indicator description
285	Humus Formation: Catch Crops Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops	On what proportion of the arable land are catch crops grown?
225	Arable land: Share of green cover outside growing period Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery	What proportion of the arable land is covered by vegetation outside the growing period? <i>EU: Period between 15. November und 15. February.</i>
237	Arable land: Share of mulching Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops	What proportion of the arable land is mulched? <i>Leaving only harvest residues on the field doesn't count as mulching (is assessed separately: ID 289).</i>
207	Arable land: Share of direct seeding Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops	What proportion of the arable land is managed by the method of direct seeding?
219	Arable land: Under sown crops Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops	What proportion of the arable land has cover crops under sown?
601	Permanent grasslands: Conversion Relevant for farms with the following activities: Arable farming, Vegetable production, Viticulture, Tropical crops	What proportion of permanent grasslands has been converted to arable land in the past 5 years?
602	Permanent grasslands: Renewal Relevant for farms with the following activities: Permanent grassland	What proportion of permanent grassland has been newly seeded in the past 5 years?
620	Permanent grasslands: Mowing frequency Relevant for farms with the following activities: Permanent grassland	How often is the grassland mowed on average?

Indicator number	Indicator name (Relevance)	Indicator description
286	<p>Soil degradation: Measures taken to counter</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>On what proportion of the agricultural area are measures taken to combat relevant soil degradation processes on the farm (e.g. compaction, pollution)?</p> <p><i>Do not consider erosion (already covered in other indicators), see list of examples, award full points if no degradation processes are evident.</i></p>
281	<p>Soil degradation: Severe soil compaction</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>On what proportion of the agricultural area has been signs of severe soil compaction (caused by either machinery or livestock)?</p>
182	<p>Plough less soil management</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the arable land is subject to zero / no-tillage or reduced tillage?</p>
741	<p>Steaming on open ground</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>1) Is soil steaming performed on open ground?</p> <p><i>If yes:</i></p> <p>2) Is deep or flat steaming performed?</p>
742	<p>Steaming in the greenhouse</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>1) Is soil steaming performed in the greenhouse?</p> <p><i>If yes:</i></p> <p>2) Is deep or flat steaming performed?</p>
749	<p>Soil disinfection</p> <p>Relevant for farms with the following activities: Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>1) On which proportion of the agricultural area are soil disinfection chemicals (e.g. fumigation) applied?</p> <p><i>If no:</i></p> <p>2) Is documentation and justification for the use of soil disinfection products available?</p>
320	<p>Crop resistance</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Are cultivars chosen with a view to resistance to harmful organisms and diseases?</p>

Indicator number	Indicator name (Relevance)	Indicator description
290	<p>Determining fertilizer requirements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When determining fertilizer requirements, are soil analysis results and/or leaf-analysis considered?</p> <p><i>Soil analyses: Once every 5 years: pH, P and K / Annually: N min</i></p>
323	<p>Mineral N fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What is the farm's mineral N fertilizer (in kg) usage per hectare per year on its agricultural area?</p>
324	<p>Mineral P fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What is the farm's total easily dissolvable mineral P fertilizer usage (P₂O₅ in kg) per hectare per year (active P ingredients) on its agricultural area?</p>
322	<p>Mineral K fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is mineral Potassium fertilizer used in a needs-oriented way on the farm's agricultural area?</p> <p><i>Rate "needs-oriented" if Potassium fertilizer isn't applied with good reason and if there is at the same time no Potassium deficiency.</i></p>
309	<p>Compost</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the organic fertilizer used is compost (plant-based or livestock-based)?</p>
708	<p>Precise fertilisation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm use systems for precise fertilisation (e.g. variable rate application methods, drip irrigation with mineral fertilisers)?</p>
231	<p>No use of synth. chem. herbicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the agricultural area does not receive synthetic chemical herbicide applications?</p>

Indicator number	Indicator name (Relevance)	Indicator description
233	<p>No use of synth. chem. fungicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the agricultural area does not receive synthetic chemical fungicide applications?</p>
234	<p>No use of synth. chem. insecticides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the agricultural area does not receive synthetic chemical insecticide applications? <i>Spinosad, Neem and other broad-range organic insecticides count.</i></p>
377,1	<p>Pesticides: Number of active substances</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>How many active substances of pesticides are used per year?</p>
740	<p>Growth regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm decline to use synthetic chemical growth regulators?</p>
747	<p>Flowering regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm use products to influence the flowering of plants or for desiccation? <i>Rate positive for nature identical ethylene gas.</i></p>
706	<p>Ebb and flow system</p> <p>Relevant for farms with the following activities: Vegetable production, Pot plants / Plant nursery</p>	<p>Does the farm use indoor ebb and flow production systems (i.e. hydroponics)?</p>
337	<p>Loss of agricultural products (food waste)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture, Tropical crops</p>	<p>On average, what proportion of the food produced on the farm had to be disposed of over the past 5 years?</p>

Indicator number	Indicator name (Relevance)	Indicator description
159,5	Average number of lactations Relevant for farms with the following activities: Dairy cattle / Goats / Sheep	What is the average number of lactations of the dairy animals?
245	Locally adapted livestock breeds Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture	Are locally adapted livestock breeds kept on the farm?
249	Hybrid livestock (poultry, pigs) Relevant for farms with the following activities: Pig production, Poultry production, Bees, Aquaculture	Does the farm keep hybrid livestock (of poultry or pigs)?
358	Cattle: Losses Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	How high was the loss of cows/beef in the past year?
358,1	Poultry: Losses Relevant for farms with the following activities: Poultry production	How high was average monthly loss of poultry in the past year? <i>Score based on poultry category with highest loss rate</i>
626	Proportion bought-in roughage Relevant for farms with the following activities: Beef cattle, Pig production, Dairy cattle / Goats / Sheep	Which proportion of the used roughage is sourced externally?
517	Feed No Food: grazing livestock Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	What proportion of the feed given to grazing livestock would be suitable for human consumption (For maize silage take standard yields for grain maize)?
518	Feed No Food: non-grazing animals Relevant for farms with the following activities: Pig production, Poultry production, Aquaculture	What proportion of the feed given to non-grazing animals would be suitable for human consumption? <i>Contrary to e.g. waste products</i> <i>Score based on worst animal category</i>
335,1	Recycling of paper/cardboards Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	What proportion of paper and cardboard is delivered to recycling points?

Indicator number	Indicator name (Relevance)	Indicator description
334,4	<p>Recycling of metal waste</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the metal waste is delivered to recycling points?
334,5	<p>Recycling of waste glass</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the waste glass is delivered to recycling points?
739	<p>Reusable packaging materials</p> <p>Relevant for farms with the following activities: Vegetable production, Fruit production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>Does the farm use reusable and multiple-use packaging?</p> <p><i>Consider buying and selling.</i></p>
190	<p>Biogas plant: share organic residues</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of organic matter - that is a surplus or leftover from food/feed production - is utilized in a biogas plant (own or external plant)?
332	<p>Electricity consumption per ha</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How much electricity is used on the farm per hectare per year?</p> <p><i>Make sure private use is not included. If only one electric meter, calculate deduction based on number of people. For private use 1.000 kWh/adult/year and 500 kWh/child/year can be deducted</i></p>
185	<p>Renewables electricity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the electricity consumed is derived from renewable resources ?

Indicator number	Indicator name (Relevance)	Indicator description
348	<p>Share of fuel from renewable sources</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the fuel consumption is provided by renewable resources?</p>
188	<p>Share of fuel from own production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Which proportion of the fuel used for farm vehicles and machinery is produced on-farm?</p>
195	<p>Energy-efficient driving (Eco-Drive)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do the farm manager and the employees use energy-efficient driving techniques (e.g. Eco-Drive advice: low speed of engine (revolutions per minute) and driving with high gears if possible etc.)?</p>
192	<p>Plants for energy production instead of human consumption</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If a farm uses plant materials for energy production:</i> What part of the substrate used for energy production would also be suitable for human consumption?</p>
187	<p>Renewables heating and hot water</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture</p>	<p>What proportion of the heating-energy consumption is provided by renewable energy or waste heat? <i>Only consider consumption related to agricultural production</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
196	<p>Insulation of heated farm buildings</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If there are heated farm buildings:</i></p> <p>What proportion of the heated farm buildings are sufficiently insulated (e.g. with double or multiple glazed windows, roof / wall / floor insulation)?</p> <p><i>Do not score heated greenhouses, covered in ID 745</i></p>
745	<p>Isolation of heated greenhouses</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Are heated greenhouses sufficiently isolated?</p>
746	<p>Heating need of plants</p> <p>Relevant for farms with the following activities: Vegetable production, Fruit production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What is the proportion of plant species or varieties which have a permanent heating need of minimum 10°C?</p>
203	<p>On-farm renewable heat production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture</p>	<p>What proportion of the heating-energy used is generated by the farm's own installations that are run with renewable sources (wood chips, geothermal, solar)?</p>
345	<p>Irrigation: Low energy technology and pumps</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p><i>Only ask/rate if irrigation is used:</i></p> <p>Does the farm use low-energy irrigation technology and pumps, drip irrigation and micro irrigation?</p> <p><i>Score positively if it is done manually</i></p>
4	<p>Environmental responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they have an environmental certificate?</p> <p><i>Inputs to consider: Feedstuffs, Mineral fertilisers, organic fertilisers (if bought in).</i></p> <p><i>Assess based on the labels (e.g. organic label).</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
162	<p>Procurement < 50 km</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>What proportion of externally sourced feed comes from within 50 km of the farm?</p> <p><i>In cases in which the origin of feed is unknown add it to ID164 (Procurement > 500 km).</i></p> <p><i>This refers to the original source of the inputs, not the point of sale.</i></p>
164	<p>Procurement > 500 km</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>What proportion of externally sourced feed comes from more than 500 km from the farm?</p> <p><i>All feed with unknown origin is added to this indicator.</i></p> <p><i>This refers to the original source of the inputs, not the point of sale.</i></p>
737	<p>Use of synthetic aggregates for soil and substrate</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>Does the farm use synthetic aggregates or chemically treated wood products (e.g. bark mulch) for the substrate?</p>
736	<p>Peat: Origin</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>Is there a risk that the peat used on the farm comes from proclaimed nature conservation areas or is of doubtful origin?</p> <p><i>If the peat is environmentally certified, answer no (labels: RPP, Veriflora).</i></p>
141	<p>Direct sales</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are there direct (on-the-farm, farmer's market) sales?</p> <p>If yes: What proportion of the farm's income comes from direct sales?</p> <p><i>If necessary estimated.</i></p>

Tab. S27 SMART Indicators for the Sub-Theme "Waste Reduction & Disposal"

Indicator number	Indicator name (Relevance)	Indicator description
720	<p>Silage storage</p> <p>Relevant for farms with the following activities: Permanent grassland, Beef cattle, Pig production, Dairy cattle / Goats / Sheep</p>	<p>Is the silage stored appropriately to minimize losses and avoid contamination?</p>

Indicator number	Indicator name (Relevance)	Indicator description
721	<p>Storage of feed concentrate</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	Is the feed concentrate stored appropriately to minimize losses and avoid contamination?
186	<p>On-farm renewable energy production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the electricity consumed is generated by the farm's own installations that are run with renewable sources ?
200	<p>Covered slurry stores (or stable natural crust)</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep</p>	<i>Only ask/rate if slurry occurs:</i> Are slurry stores covered or does a stable natural crust cover the surface?
520	<p>Production of fibre crops</p> <p>Relevant for farms with the following activities: Arable farming, Tropical crops</p>	On what proportion of the farm's arable land natural fibre crops (cotton, sisal, flax, hemp etc.) are produced?
301	<p>Contamination tests before using bought-in fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<i>Only in cases, in which external organic fertilizers are applied (e.g. compost, sewage, sludge):</i> Are only substances applied (e.g. composts, sewage sludge, wastewater) that have been tested for contamination beforehand (primarily heavy metals, antibiotics) and found to be safe? <i>Rate positive if fertilizers from other organic farms are applied.</i>
289	<p>Humus formation: Crop residues</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	On what proportion of the arable land crop residues (e.g. straw, beet tops) are not removed?
320	<p>Crop resistance</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Are cultivars chosen with a view to resistance to harmful organisms and diseases?

Indicator number	Indicator name (Relevance)	Indicator description
290	<p>Determining fertilizer requirements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When determining fertilizer requirements, are soil analysis results and/or leaf-analysis considered?</p> <p><i>Soil analyses: Once every 5 years: pH, P and K / Annually: Nmin</i></p>
308	<p>Farmyard manure</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion (volume) of the organic fertilizer used is farmyard manure?</p>
309	<p>Compost</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the organic fertilizer used is compost (plant-based or livestock-based)?</p>
231	<p>No use of synth. chem. herbicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the agricultural area does not receive synthetic chemical herbicide applications?</p>
233	<p>No use of synth. chem. fungicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the agricultural area does not receive synthetic chemical fungicide applications?</p>
234	<p>No use of synth. chem. insecticides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the agricultural area does not receive synthetic chemical insecticide applications?</p> <p><i>Spinosad, Neem and other broad-range organic insecticides count.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
377,1	<p>Pesticides: Number of active substances</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	How many active substances of pesticides are used per year?
474,1	<p>Pesticides: Persistence water</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Pesticides: Are active substances used, which are considered very persistent in water (half-life > 60 days) according to the "PAN Pesticide Database"?
474,2	<p>Pesticides: Persistence soil</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Pesticides: Are active substances used, which are considered to be very persistent in soil (half-life > 180 days) according to the "PAN Pesticide Database"?
740	<p>Growth regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farm decline to use synthetic chemical growth regulators ?
747	<p>Flowering regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farm use products to influence the flowering of plants or for desiccation ? <i>Rate positive for nature identical ethylene gas.</i>
337	<p>Loss of agricultural products (food waste)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture, Tropical crops</p>	On average, what proportion of the food produced on the farm had to be disposed of over the past 5 years?
159,5	<p>Average number of lactations</p> <p>Relevant for farms with the following activities: Dairy cattle / Goats / Sheep</p>	What is the average number of lactations of the dairy animals?
608	<p>Use of antibiotic drying agents</p> <p>Relevant for farms with the following activities: Dairy cattle / Goats / Sheep</p>	Does the farm use antibiotic drying agents?

Indicator number	Indicator name (Relevance)	Indicator description
352	<p>Livestock health: Proportion of curative treatments</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>What proportion of the animals (across all livestock categories) received curative antibiotics treatments (for actual illnesses) during the last year?</p>
353	<p>Livestock health: Proportion of prophylactic treatments</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>What proportion of the animals (across all livestock categories) was given prophylactic treatments, preventive before any clinical signs of disease, including for purposes of enhanced performance, during the past year?</p>
765	<p>Correct waste disposal</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is all operational/commercial waste disposed correctly?</p> <p>Exclude pesticides and veterinary medicines (already covered in ID 327)</p> <p>Consider waste e.g.: <i>Waste oil, used tyres, batteries, plastics, metal, paper/cardboard, glass and other waste</i></p> <p><i>Comment: score positive if waste is collected by public/private services (for e.g. incineration, covered land-fill)</i></p>
327	<p>Waste disposal: pesticides and veterinary medicines</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are all waste materials from plant protection products and veterinary medicines disposed properly?</p> <p><i>Score positive if no such wastes arise</i></p>
335,1	<p>Recycling of paper/cardboards</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of paper and cardboard is delivered to recycling points?</p>

Indicator number	Indicator name (Relevance)	Indicator description
334	<p>Recycling of waste oil</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the used oil is delivered to recycling points?
334,1	<p>Recycling of used tyres</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of used tyres is delivered to recycling points?
334,2	<p>Recycling of used batteries</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of used batteries is delivered to recycling points?
334,3	<p>Recycling of plastic waste</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the plastic waste is delivered to recycling points?
334,4	<p>Recycling of metal waste</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the metal waste is delivered to recycling points?
334,5	<p>Recycling of waste glass</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the waste glass is delivered to recycling points?

Indicator number	Indicator name (Relevance)	Indicator description
331	<p>Waste disposal: cadaver livestock</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Are all animal wastes/cadavers disposed properly (not harm human to health and environment)?</p> <p><i>Score positive if no such wastes arise</i></p>
739	<p>Reusable packaging materials</p> <p>Relevant for farms with the following activities: Vegetable production, Fruit production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>Does the farm use reusable and multiple-use packaging?</p> <p><i>Consider buying and selling.</i></p>
190	<p>Biogas plant: share organic residues</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of organic matter - that is a surplus or leftover from food/feed production - is utilized in a biogas plant (own or external plant)?</p>
332	<p>Electricity consumption per ha</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How much electricity is used on the farm per hectare per year?</p> <p><i>Make sure private use is not included. If only one electric meter, calculate deduction based on number of people. For private use 1.000 kWh/adult/year and 500 kWh/child/year can be deducted</i></p>
4	<p>Environmental responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they have an environmental certificate?</p> <p><i>Inputs to consider: Feedstuffs, Mineral fertilisers, organic fertilisers (if bought in).</i></p> <p><i>Assess based on the labels (e.g. organic label).</i></p>
737	<p>Use of synthetic aggregates for soil and substrate</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>Does the farm use synthetic aggregates or chemically treated wood products (e.g. bark mulch) for the substrate?</p>

Indicator number	Indicator name (Relevance)	Indicator description
167	<p>Contaminated products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Have any contaminated products returned to the farm in the last 5 years that posed a risk for food safety?</p>
169	<p>Cases of contamination: Measures</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If contaminated products have left the farm:</i> Have steps been taken to prevent this in future?</p> <p><i>If no contaminated products have left the farm:</i> Are there measures to prevent contaminated products from leaving the farm?</p> <p><i>Do not ask about the following aspects as they are covered by other indicators: antibiotics, cell counts for milk</i></p>
63	<p>Proportion of environmentally certified products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of sales products is certified to carry an ecolabel?</p> <p><i>All environmental labels are valid that are recommended from WWF (2010):</i> http://assets.wwf.ch/downloads/hintergrundbericht_1_abelratgeber_2010_def_low.pdf.</p>
141	<p>Direct sales</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are there direct (on-the-farm, farmer's market) sales?</p> <p>If yes: What proportion of the farm's income comes from direct sales?</p> <p><i>If necessary estimated.</i></p>
515	<p>Subsistence farming</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture, Tropical crops</p>	<p>To what extent does the farm supply its own food needs and those of its employees, as far as the local environmental conditions allow?</p>

Tab. S28 SMART Indicators for the Sub-Theme “Animal Health”

Indicator number	Indicator name (Relevance)	Indicator description
701	Loose-housing system Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	Does the farm have a loose-livestock housing system?
368	Stocking density Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture	Are stocking densities in the housing system (animals/m ² of floor space) adequate (sufficient space for movements and to avoid animal injuries and stress due to conflicts) for all livestock categories?
368,1	Animal-friendly housing system Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture	Does the farm comply with requirements for particularly animal-friendly housing systems and/or are the conditions beyond the legal minimum in the country?
715	Hardness of the lying area Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	How hard is the lying area in the livestock housing areas?
717	Size of the lying area Relevant for farms with the following activities: Beef cattle, Pig production, Dairy cattle / Goats / Sheep	Are the lying areas adequate to allow a species-appropriate space for lying down / standing up?
361	Cleanness of livestock / housing Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture	Are the animals and their environment (housing, exercise yard, fish tanks, apiary etc.) clean? <i>Score based on the worst condition.</i>
363	Air quality in livestock housing Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture	Is the air quality adequate? <i>Score based on the worst condition.</i>
728	Materials to keep animals busy Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep	Do the animals have permanent access to materials (which are not harmful to health) to keep them busy appropriate to their species? <i>Evaluate based on the least sufficient species-appropriate objects.</i>

Indicator number	Indicator name (Relevance)	Indicator description
369	<p>Number and quality of drinking points</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep</p>	<p>Are there sufficient numbers of clean, functioning drinking points for all livestock categories?</p> <p>Score negative if distance is >300m (for ruminants)</p>
359	<p>Light in livestock housing</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Are the light conditions in livestock housing adequate?</p> <p><i>a) rate yes if it is possible to read a text in the darkest area of the stable</i></p> <p><i>b) if different stables are assessed: score based on the worst condition of livestock housing</i></p>
362	<p>Technical noise in livestock housing</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Is the technical noise pollution in the livestock housing low?</p> <p><i>a) Rate yes, if it is possible to have a conversation at a distance of 2m when ventilation and other machinery are running in livestock housing (technical noise only)?</i></p> <p><i>b) Score based on the worst condition.</i></p>
720	<p>Silage storage</p> <p>Relevant for farms with the following activities: Permanent grassland, Beef cattle, Pig production, Dairy cattle / Goats / Sheep</p>	<p>Is the silage stored appropriately to minimize losses and avoid contamination?</p>
615	<p>Maternity pen</p> <p>Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep</p>	<p>Does the animal housing have a maternity pen?</p>
616	<p>Quarantine space (pens) for sick animals</p> <p>Relevant for farms with the following activities: Beef cattle, Poultry production, Dairy cattle / Goats / Sheep</p>	<p>Does the farm have a quarantine space (pens) for sick animals?</p>
367	<p>Protection from heat and cold for animals</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep</p>	<p>Are on pasture and in the exercise yard enough shelter for the animals from the heat, direct sunlight and cold?</p> <p><i>Score based on the worst condition.</i></p>
719,1	<p>Poultry: cover of vegetation at open-air access</p> <p>Relevant for farms with the following activities: Poultry production</p>	<p><i>If there is an open-air access for poultry:</i></p> <p>What is the percentage of vegetation coverage of the open-air access?</p> <p><i>Score based on worst poultry access.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
721	Storage of feed concentrate Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture	Is the feed concentrate stored appropriately to minimize losses and avoid contamination?
380	On-farm point sources of nutrients and pollutants Relevant for farms with the following activities: Arable farming, Vegetable production, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture	Can it be excluded that there are direct point source emissions of nutrients and pollutants to the atmosphere and water bodies (incl. wells and drinking water sources) on the farm and its utilized areas? <i>e.g. exports (= emissions through discharge and degas) from exercise yards, farmyard manure stores, livestock water facilities or shelter of animals near to water on pastures, direct entry of animals into the water and cleaning areas.</i>
722	Injuries of pigs Relevant for farms with the following activities: Pig production	What is the proportion of pigs with abrasions, bite wounds, scuffing marks, scratches, abscesses, injuries and wounds (incl. tails and ears)?
511	Contamination through emissions: exhaust emissions, factories or airports Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	Is there a risk of contamination from motorways/heavy traffic roads, industry or airports?
159,5	Average number of lactations Relevant for farms with the following activities: Dairy cattle / Goats / Sheep	What is the average number of lactations of the dairy animals?
614	Complaints regarding exceeded cell counts Relevant for farms with the following activities: Dairy cattle / Goats / Sheep	Were there any complaints from dairy manufacturers regarding exceeded cell counts in the past 5 years?
198	Dual-purpose breeds: Ruminants Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	What proportion of the ruminants are dual-purpose breeds? <i>Any dual-purpose breed that is only kept for one purpose (e.g. meat only/dairy only) does not count as a dual-purpose breed.</i>

Indicator number	Indicator name (Relevance)	Indicator description
198,1	<p>Dual-purpose breeds: chickens Relevant for farms with the following activities: Poultry production</p>	<p>What proportion of the chickens are dual-purpose breeds? <i>Any dual-purpose breed that is only kept for one purpose (e.g. meat only/eggs only) does not count as a dual-purpose breed.</i></p>
245	<p>Locally adapted livestock breeds Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Are locally adapted livestock breeds kept on the farm?</p>
249	<p>Hybrid livestock (poultry, pigs) Relevant for farms with the following activities: Pig production, Poultry production, Bees, Aquaculture</p>	<p>Does the farm keep hybrid livestock (of poultry or pigs)?</p>
356	<p>Share of dehorned ruminants Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep</p>	<p>What proportion of ruminants is subject to dehorning?</p>
754	<p>Poultry: Beak trimming Relevant for farms with the following activities: Poultry production</p>	<p>What proportion of poultry is subject to beak trimming?</p>
357	<p>Mutilation: Use of anaesthetics and analgesics Relevant for farms with the following activities: Beef cattle, Pig production, Dairy cattle / Goats / Sheep</p>	<p>Are anaesthetics and analgesics used when animals are mutilated?</p>
608	<p>Use of antibiotic drying agents Relevant for farms with the following activities: Dairy cattle / Goats / Sheep</p>	<p>Does the farm use antibiotic drying agents?</p>
352	<p>Livestock health: Proportion of curative treatments Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>What proportion of the animals (across all livestock categories) received curative antibiotics treatments (for actual illnesses) during the last year?</p>
358	<p>Cattle: Losses Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep</p>	<p>How high was the loss of cows/beef in the past year?</p>
358,1	<p>Poultry: Losses Relevant for farms with the following activities: Poultry production</p>	<p>How high was average monthly loss of poultry in the past year? <i>Score based on poultry category with highest loss rate</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
611	Measures for hoof care Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	Are measures (also preventative) taken for hoof care?
612	Proportion of lameness animals Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep	What is the proportion of lame animals?
353	Livestock health: Proportion of prophylactic treatments Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture	What proportion of the animals (across all livestock categories) was given prophylactic treatments, preventive before any clinical signs of disease, including for purposes of enhanced performance, during the past year?
613	Livestock health: Hormonal treatment for problems with livestock in heat Relevant for farms with the following activities: Beef cattle, Pig production, Dairy cattle / Goats / Sheep	Does the farm use hormonal treatments for livestock with in-heat problems?
755	Pigs: Docking/use of nose rings Relevant for farms with the following activities: Pig production	What proportion of pigs is subject to docking and/or the use of nose rings?
716	Losses of calves Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	How high was the loss of calves (calves up to 65 kg) in the past year?
723	Buying new animals Relevant for farms with the following activities: Pig production	Does the farm pay attention to written information (data) about the health condition when buying new animals (incl. breed, vaccination, treatments)?
724	Fattening pigs: Losses Relevant for farms with the following activities: Pig production	How high was the loss of fattening pigs (in %) in the past year?
726	Polishing teeth with piglets Relevant for farms with the following activities: Pig production	What is the proportion of piglets with polished teeth?
727	Losses of piglets Relevant for farms with the following activities: Pig production	How high is the loss of piglets (up to 25 kg) incl. stillbirths (average of the past 5 years)?

Indicator number	Indicator name (Relevance)	Indicator description
227	<p>Alpine pasturage and shepherding</p> <p>Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep</p>	<p>What proportion of the livestock is moved to alpine pasture in the summer?</p> <p><i>Do not answer question if in a region with no alpine pasture.</i></p>
370,5	<p>Daily outdoor access for animals</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep</p>	<p>Do all animals have daily outdoor access (year-round)?</p> <p><i>Score based on worst animal category</i></p> <p><i>For poultry: possibility for outdoor access is sufficient</i></p>
371	<p>Access to pasture: Months per year</p> <p>Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep</p>	<p>How many days per year are the ruminants out on pasture?</p> <p>Ask for summer and winter separately</p>
372	<p>Outdoor access for pigs: Hours per day</p> <p>Relevant for farms with the following activities: Pig production</p>	<p>On average, how many hours per day do the pigs have outdoor access?</p>
373	<p>Outdoor access for poultry: Hours per day</p> <p>Relevant for farms with the following activities: Poultry production</p>	<p>On average, how many hours per day do the poultry have outdoor access?</p> <p><i>In case of several livestock housing/animal species: score based on the worst condition.</i></p>
375	<p>Animal welfare standards slaughter</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Does the farm manager know the welfare standards of the slaughterhouse?</p> <p><i>Score based on worst animal category. If farmer is not familiar with the welfare standards, rate as negative</i></p>
374	<p>Duration of transport to abattoir</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep</p>	<p>What is the average duration of livestock transportation to the abattoir (in minutes)?</p> <p><i>Score based on worst animal category. If animals are slaughtered at the farm score positive.</i></p>
334,3	<p>Recycling of plastic waste</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the plastic waste is delivered to recycling points?</p>

Indicator number	Indicator name (Relevance)	Indicator description
331	<p>Waste disposal: cadaver livestock</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Are all animal wastes/cadavers disposed properly (not harm human to health and environment)?</p> <p><i>Score positive if no such wastes arise</i></p>
63	<p>Proportion of environmentally certified products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of sales products is certified to carry an ecolabel?</p> <p><i>All environmental labels are valid that are recommended from WWF (2010):</i></p> <p><i>http://assets.wwf.ch/downloads/hintergrundbericht_1_abelratgeber_2010_def_low.pdf</i></p>
624	<p>Instruction temporary workers / visitors in handling animals</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Are temporary workers and visitors on the farm sufficiently instructed to ensure maximum animal welfare?</p>

Tab. S29 SMART Indicators for the Sub-Theme “Freedom from Stress”

Indicator number	Indicator name (Relevance)	Indicator description
701	<p>Loose-housing system</p> <p>Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep</p>	<p>Does the farm have a loose-livestock housing system?</p>
368	<p>Stocking density</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Are stocking densities in the housing system (animals/m² of floor space) adequate (sufficient space for movements and to avoid animal injuries and stress due to conflicts) for all livestock categories?</p>
368,1	<p>Animal-friendly housing system</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Does the farm comply with requirements for particularly animal-friendly housing systems and/or are the conditions beyond the legal minimum in the country?</p>

Indicator number	Indicator name (Relevance)	Indicator description
715	Hardness of the lying area Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	How hard is the lying area in the livestock housing areas?
717	Size of the lying area Relevant for farms with the following activities: Beef cattle, Pig production, Dairy cattle / Goats / Sheep	Are the lying areas adequate to allow a species-appropriate space for lying down / standing up?
361	Cleanness of livestock / housing Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture	Are the animals and their environment (housing, exercise yard, fish tanks, apiary etc.) clean? <i>Score based on the worst condition.</i>
363	Air quality in livestock housing Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture	Is the air quality adequate? <i>Score based on the worst condition.</i>
728	Materials to keep animals busy Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep	Do the animals have permanent access to materials (which are not harmful to health) to keep them busy appropriate to their species? <i>Evaluate based on the least sufficient species-appropriate objects.</i>
369	Number and quality of drinking points Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep	Are there sufficient numbers of clean, functioning drinking points for all livestock categories? Score negative if distance is >300m (for ruminants)
359	Light in livestock housing Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture	Are the light conditions in livestock housing adequate? <i>a) rate yes if it is possible to read a text in the darkest area of the stable</i> <i>b) if different stables are assessed: score based on the worst condition of livestock housing</i>
362	Technical noise in livestock housing Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture	Is the technical noise pollution in the livestock housing low? <i>a) Rate yes, if it is possible to have a conversation at a distance of 2m when ventilation and other machinery are running in livestock housing (technical noise only)?</i> <i>b) Score based on the worst condition.</i>

Indicator number	Indicator name (Relevance)	Indicator description
615	Maternity pen Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	Does the animal housing have a maternity pen?
616	Quarantine space (pens) for sick animals Relevant for farms with the following activities: Beef cattle, Poultry production, Dairy cattle / Goats / Sheep	Does the farm have a quarantine space (pens) for sick animals?
367	Protection from heat and cold for animals Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep	Are on pasture and in the exercise yard enough shelter for the animals from the heat, direct sunlight and cold? <i>Score based on the worst condition.</i>
719,1	Poultry: cover of vegetation at open-air access Relevant for farms with the following activities: Poultry production	<i>If there is an open-air access for poultry:</i> What is the percentage of vegetation coverage of the open-air access? <i>Score based on worst poultry access.</i>
722	Injuries of pigs Relevant for farms with the following activities: Pig production	What is the proportion of pigs with abrasions, bite wounds, scuffing marks, scratches, abscesses, injuries and wounds (incl. tails and ears)?
511	Contamination through emissions: exhaust emissions, factories or airports Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	Is there a risk of contamination from motorways/heavy traffic roads, industry or airports?
159,5	Average number of lactations Relevant for farms with the following activities: Dairy cattle / Goats / Sheep	What is the average number of lactations of the dairy animals?
614	Complaints regarding exceeded cell counts Relevant for farms with the following activities: Dairy cattle / Goats / Sheep	Were there any complaints from dairy manufacturers regarding exceeded cell counts in the past 5 years?
198	Dual-purpose breeds: Ruminants Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	What proportion of the ruminants are dual-purpose breeds? <i>Any dual-purpose breed that is only kept for one purpose (e.g. meat only/dairy only) does not count as a dual-purpose breed.</i>

Indicator number	Indicator name (Relevance)	Indicator description
198,1	Dual-purpose breeds: chickens Relevant for farms with the following activities: Poultry production	What proportion of the chickens are dual-purpose breeds? <i>Any dual-purpose breed that is only kept for one purpose (e.g. meat only/eggs only) does not count as a dual-purpose breed.</i>
245	Locally adapted livestock breeds Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture	Are locally adapted livestock breeds kept on the farm?
249	Hybrid livestock (poultry, pigs) Relevant for farms with the following activities: Pig production, Poultry production, Bees, Aquaculture	Does the farm keep hybrid livestock (of poultry or pigs)?
356	Share of dehorned ruminants Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	What proportion of ruminants is subject to dehorning?
754	Poultry: Beak trimming Relevant for farms with the following activities: Poultry production	What proportion of poultry is subject to beak trimming?
357	Mutilation: Use of anaesthetics and analgesics Relevant for farms with the following activities: Beef cattle, Pig production, Dairy cattle / Goats / Sheep	Are anaesthetics and analgesics used when animals are mutilated?
608	Use of antibiotic drying agents Relevant for farms with the following activities: Dairy cattle / Goats / Sheep	Does the farm use antibiotic drying agents?
352	Livestock health: Proportion of curative treatments Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture	What proportion of the animals (across all livestock categories) received curative antibiotics treatments (for actual illnesses) during the last year?
358	Cattle: Losses Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	How high was the loss of cows/beef in the past year?
358,1	Poultry: Losses Relevant for farms with the following activities: Poultry production	How high was average monthly loss of poultry in the past year? <i>Score based on poultry category with highest loss rate</i>

Indicator number	Indicator name (Relevance)	Indicator description
611	Measures for hoof care Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	Are measures (also preventative) taken for hoof care?
612	Proportion of lameness animals Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep	What is the proportion of lame animals?
353	Livestock health: Proportion of prophylactic treatments Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture	What proportion of the animals (across all livestock categories) was given prophylactic treatments, preventive before any clinical signs of disease, including for purposes of enhanced performance, during the past year?
613	Livestock health: Hormonal treatment for problems with livestock in heat Relevant for farms with the following activities: Beef cattle, Pig production, Dairy cattle / Goats / Sheep	Does the farm use hormonal treatments for livestock with in-heat problems?
755	Pigs: Docking/use of nose rings Relevant for farms with the following activities: Pig production	What proportion of pigs is subject to docking and/or the use of nose rings?
716	Losses of calves Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	How high was the loss of calves (calves up to 65 kg) in the past year?
723	Buying new animals Relevant for farms with the following activities: Pig production	Does the farm pay attention to written information (data) about the health condition when buying new animals (incl. breed, vaccination, treatments)?
724	Fattening pigs: Losses Relevant for farms with the following activities: Pig production	How high was the loss of fattening pigs (in %) in the past year?
726	Polishing teeth with piglets Relevant for farms with the following activities: Pig production	What is the proportion of piglets with polished teeth?
727	Losses of piglets Relevant for farms with the following activities: Pig production	How high is the loss of piglets (up to 25 kg) incl. stillbirths (average of the past 5 years)?

Indicator number	Indicator name (Relevance)	Indicator description
227	Alpine pasturage and shepherding Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	What proportion of the livestock is moved to alpine pasture in the summer? <i>Do not answer question if in a region with no alpine pasture.</i>
370,5	Daily outdoor access for animals Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep	Do all animals have daily outdoor access (year-round)? <i>Score based on worst animal category</i> <i>For poultry: possibility for outdoor access is sufficient</i>
371	Access to pasture: Months per year Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	How many days per year are the ruminants out on pasture? Ask for summer and winter separately
372	Outdoor access for pigs: Hours per day Relevant for farms with the following activities: Pig production	On average, how many hours per day do the pigs have outdoor access?
373	Outdoor access for poultry: Hours per day Relevant for farms with the following activities: Poultry production	On average, how many hours per day do the poultry have outdoor access? <i>In case of several livestock housing/animal species: score based on the worst condition.</i>
375	Animal welfare standards slaughter Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture	Does the farm manager know the welfare standards of the slaughterhouse? <i>Score based on worst animal category. If farmer is not familiar with the welfare standards, rate as negative</i>
374	Duration of transport to abattoir Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep	What is the average duration of livestock transportation to the abattoir (in minutes)? <i>Score based on worst animal category. If animals are slaughtered at the farm score positive.</i>
624	Instruction temporary workers / visitors in handling animals Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture	Are temporary workers and visitors on the farm sufficiently instructed to ensure maximum animal welfare?

Tab. S30 SMART Indicators for the Sub-Theme “Internal Investment”

Indicator number	Indicator name (Relevance)	Indicator description
186	<p>On-farm renewable energy production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the electricity consumed is generated by the farm’s own installations that are run with renewable sources?</p>
288	<p>Arable land: Erosion control > 15 %</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Tropical crops</p>	<p>Are sufficient measures taken on agricultural areas (excluding permanent grassland) with sloping gradients higher than 15 % (up to 30%) to prevent erosion (e.g. contour ploughing)?</p>
299	<p>Arable land: Green cover > 30 %</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Care is taken on agricultural areas with sloping gradients higher than 30 % to ensure a good, continuous green cover (under sown crops, catch crops etc.)?</p>
767	<p>Land ownership</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farmer have secure tenure rights over the land for at least 10 years?</p>
744	<p>On farm Biodiversity promotion</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Are beneficial organisms on the farm protected and promoted?</p>

Indicator number	Indicator name (Relevance)	Indicator description
711	<p>Ecological compensation areas: Valuable landscape elements - Interconnection</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do the farm implement measures on its agricultural area to enhance the interconnection of ecological compensation areas and/or ecological valuable landscape elements?</p> <p><i>If neither ecological compensation areas nor ecological valuable landscape elements existing on the farm's agricultural area, then rate "No".</i></p>
215	<p>Arable land: Share of temporary grasslands</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>What proportion of the arable land is devoted to temporary grassland (grass-clover, ley, alfalfa etc.)?</p>
285	<p>Humus Formation: Catch Crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>On what proportion of the arable land are catch crops grown?</p>
225	<p>Arable land: Share of green cover outside growing period</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>What proportion of the arable land is covered by vegetation outside the growing period?</p> <p><i>EU: Period between 15. November und 15. February.</i></p>
219	<p>Arable land: Under sown crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	<p>What proportion of the arable land has cover crops under sown?</p>
286	<p>Soil degradation: Measures taken to counter</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>On what proportion of the agricultural area are measures taken to combat relevant soil degradation processes on the farm (e.g. compaction, pollution)?</p> <p><i>Do not consider erosion (already covered in other indicators), see list of examples, award full points if no degradation processes are evident.</i></p>
298	<p>Soil improvement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of formerly degraded lands (not suitable for farming) has been regenerated over the past 20 years and can again be used for farming?</p> <p><i>Measures include e.g. compost applications, liming, fertilizer applications</i></p> <p><i>Full score for completely fertile soils</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
182	<p>Plough less soil management</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the arable land is subject to zero / no-tillage or reduced tillage?</p>
301	<p>Contamination tests before using bought-in fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>Only in cases, in which external organic fertilizers are applied (e.g. compost, sewage, sludge):</i></p> <p>Are only substances applied (e.g. composts, sewage sludge, wastewater) that have been tested for contamination beforehand (primarily heavy metals, antibiotics) and found to be safe?</p> <p><i>Rate positive if fertilizers from other organic farms are applied.</i></p>
741	<p>Steaming on open ground</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>1) Is soil steaming performed on open ground?</p> <p><i>If yes:</i></p> <p>2) Is deep or flat steaming performed?</p>
742	<p>Steaming in the greenhouse</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>1) Is soil steaming performed in the greenhouse?</p> <p><i>If yes:</i></p> <p>2) Is deep or flat steaming performed?</p>
309	<p>Compost</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the organic fertilizer used is compost (plant-based or livestock-based)?</p>
708	<p>Precise fertilisation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm use systems for precise fertilisation (e.g. variable rate application methods, drip irrigation with mineral fertilisers)?</p>
710	<p>Harmful substances P-fertilisers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm only use mineral P-fertilisers, which comply with the limits of harmful substances (heavy metals and uranium)?</p>

Indicator number	Indicator name (Relevance)	Indicator description
231	<p>No use of synth. chem. herbicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the agricultural area does not receive synthetic chemical herbicide applications?
233	<p>No use of synth. chem. fungicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	What proportion of the agricultural area does not receive synthetic chemical fungicide applications?
234	<p>No use of synth. chem. insecticides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the agricultural area does not receive synthetic chemical insecticide applications?</p> <p><i>Spinosad, Neem and other broad-range organic insecticides count.</i></p>
387	<p>Water use efficiency</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery</p>	Are techniques applied to improve water use efficiency?
405	<p>Water storage capacity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Do sufficient capacities exist for water storage on the farm (retention basins, cisterns)?
619,1	<p>Proportion drained arable land which is not on moorland</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	<p>What is the proportion of drained arable land that is not on moorland (including peatland, wetland)?</p> <p><i>Comment: Consider all dewatering measures of the past 20 years (e.g. draining, trenching)</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
618,1	<p>Proportion drained permanent grassland which is not on moorland</p> <p>Relevant for farms with the following activities: Permanent grassland, Tropical crops</p>	<p>What is the proportion of drained grassland that is not on moorland (including peatland, wetland)?</p> <p><i>Comment: Consider all dewatering measures of the past 20 years (e.g. draining, trenching)</i></p>
188	<p>Share of fuel from own production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Which proportion of the fuel used for farm vehicles and machinery is produced on-farm?</p>
192	<p>Plants for energy production instead of human consumption</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If a farm uses plant materials for energy production:</i></p> <p>What part of the substrate used for energy production would also be suitable for human consumption?</p>
196	<p>Insulation of heated farm buildings</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If there are heated farm buildings:</i></p> <p>What proportion of the heated farm buildings are sufficiently insulated (e.g. with double or multiple glazed windows, roof / wall / floor insulation)?</p> <p><i>Do not score heated greenhouses, covered in ID 745</i></p>
203	<p>On-farm renewable heat production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture</p>	<p>What proportion of the heating-energy used is generated by the farm's own installations that are run with renewable sources (wood chips, geothermal, solar)?</p>

Indicator number	Indicator name (Relevance)	Indicator description
345	<p>Irrigation: Low energy technology and pumps</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p><i>Only ask/rate if irrigation is used:</i></p> <p>Does the farm use low-energy irrigation technology and pumps, drip irrigation and micro irrigation? <i>Score positively if it is done manually</i></p>
72	<p>Further training for farm staff</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How many days of further education or training (per person) were taken during the last year (including farm manager and employees)?</p> <p><i>Further training: External person on the farm or participation in external, thematic events (excluding trade shows!).</i></p> <p><i>Total number of days spent for further training during last year on average per person.</i></p>
412	<p>Employees: Access to external training</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the employees had access to external training in the past 5 years (at least 1 training course)? How does the farm financially support this? <i>Account for all employees, for which an external training was financed.</i></p>
119	<p>Apprenticeships</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are apprenticeships and/or traineeships regularly offered on the farm?</p> <p><i>Ratio of numbers of apprenticeships and other training opportunities to full time equivalent employees.</i></p>
73	<p>Long term investments</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Has the farm invested in long-term improvements to infrastructure (buildings, roads) or in the purchase of further productive land in the last 10 years?</p>

Indicator number	Indicator name (Relevance)	Indicator description
770	<p>Farm savings</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Does the farm have adequate savings to cater for its cash needs?

Tab. S31 SMART Indicators for the Sub-Theme “Community Investment”

Indicator number	Indicator name (Relevance)	Indicator description
229	<p>Ecological compensation areas: share of agricultural land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the agricultural area are ecological compensation areas / areas to promote biodiversity?</p> <p><i>Check for documents/evidence that areas are extensively cultivated or not cultivated at all.</i></p>
711	<p>Ecological compensation areas: Valuable landscape elements - Interconnection</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do the farm implement measures on its agricultural area to enhance the interconnection of ecological compensation areas and/or ecological valuable landscape elements?</p> <p><i>If neither ecological compensation areas nor ecological valuable landscape elements existing on the farm’s agricultural area, then rate "No".</i></p>
605	<p>Management of riparian strips</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Are the riparian strips extensively managed (minimum width 3m, no cultivation, no fertilizers, no pesticides)?
244	<p>Number of scattered fruit trees</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	How many scattered fruit trees does the farm have (trees per ha agricultural area)?

Indicator number	Indicator name (Relevance)	Indicator description
202	<p>Agro-forestry systems</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the farm's agricultural area is devoted to agro-forestry systems?
208	<p>Woodlands: Share of agricultural land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the farmland (all area types of the farm) is woodland?
204	<p>Woodlands: Deforestation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Which portion of the farm's current agricultural area has been deforested over the past 20 years?</p> <p><i>Remark: deforestation = removal of a forest or stand of trees were the land is thereafter converted to a non-forest use.</i></p>
290	<p>Determining fertilizer requirements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When determining fertilizer requirements, are soil analysis results and/or leaf-analysis considered?</p> <p><i>Soil analyses: Once every 5 years: pH, P and K / Annually: Nmin</i></p>
246	<p>Rare and endangered livestock breeds</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	Are rare or endangered livestock breeds kept on the farm?
335,1	<p>Recycling of paper/cardboards</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of paper and cardboard is delivered to recycling points?

Indicator number	Indicator name (Relevance)	Indicator description
512	<p>Number of jobs created/removed</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	How many new (= additional) jobs have been created at your farm in the past 5 years, or how many jobs have been removed?
125	<p>Training on sustainability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If participated in training:</i></p> <p>Have competences/knowledge relating to environmental, social and economic sustainability also been taught?</p>
752	<p>Education and training at master level (master crafts men places)</p> <p>Relevant for farms with the following activities: Pot plants / Plant nursery</p>	<p>Is education and training at master level (master crafts men places) regularly offered?</p> <p><i>Quotient of numbers of master trainings to full time equivalent employees.</i></p>
74	<p>Environmental involvement outside the farm: Costs</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is the farm involved in environmental protection (not paid for), besides its own land? If yes, how many days per year are taken for such projects?
75	<p>Social involvement outside the farm: Costs</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is the farm involved in social matters (not paid for) in the community? If yes, how many days on average per year are taken for this commitment?

Indicator number	Indicator name (Relevance)	Indicator description
502	<p>Public health measures</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm support or offer health measures / projects for the general public?</p> <p><i>Examples: Provide courses for free to the public e.g. related to healthy foods or lifestyle.</i></p>
506	<p>Food security measures for local communities</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Aquaculture, Tropical crops</p>	<p>Does the farm take steps / implement projects to enhance the food security of the local community, or does it financially support such efforts?</p> <p><i>Examples: Teach other farmers how to store or to further process raw products.</i></p>

Tab. S32 SMART Indicators for the Sub-Theme “Long-Ranging Investment”

Indicator number	Indicator name (Relevance)	Indicator description
186	<p>On-farm renewable energy production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the electricity consumed is generated by the farm’s own installations that are run with renewable sources?</p>
767	<p>Land ownership</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farmer have secure tenure rights over the land for at least 10 years?</p>

Indicator number	Indicator name (Relevance)	Indicator description
229	<p>Ecological compensation areas: share of agricultural land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the agricultural area are ecological compensation areas / areas to promote biodiversity?</p> <p><i>Check for documents/evidence that areas are extensively cultivated or not cultivated at all.</i></p>
711	<p>Ecological compensation areas: Valuable landscape elements - Interconnection</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do the farm implement measures on its agricultural area to enhance the interconnection of ecological compensation areas and/or ecological valuable landscape elements?</p> <p><i>If neither ecological compensation areas nor ecological valuable landscape elements existing on the farm's agricultural area, then rate "No".</i></p>
244	<p>Number of scattered fruit trees</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How many scattered fruit trees does the farm have (trees per ha agricultural area)?</p>
202	<p>Agro-forestry systems</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the farm's agricultural area is devoted to agro-forestry systems?</p>
620	<p>Permanent grasslands: Mowing frequency</p> <p>Relevant for farms with the following activities: Permanent grassland</p>	<p>How often is the grassland mowed on average?</p>
287	<p>Soil degradation: Compaction due to heavy machinery</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>When heavy machinery is used, are measures taken to reduce wheel load (twin tyres) and surface contact pressure (reduced inflation pressure)?</p>

Indicator number	Indicator name (Relevance)	Indicator description
298	<p>Soil improvement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of formerly degraded lands (not suitable for farming) has been regenerated over the past 20 years and can again be used for farming?</p> <p><i>Measures include e.g. compost applications, liming, fertilizer applications</i></p> <p><i>Full score for completely fertile soils</i></p>
748	<p>Humus Formation: Humus balance</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	<p>1) Is the humus balance calculated?</p> <p>2) Is the humus balance positive, balanced or negative on average? <i>In case of small farms, check whether the farmer focuses on practices that improve humus balance</i></p>
741	<p>Steaming on open ground</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>1) Is soil steaming performed on open ground?</p> <p><i>If yes:</i></p> <p>2) Is deep or flat steaming performed?</p>
742	<p>Steaming in the greenhouse</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>1) Is soil steaming performed in the greenhouse?</p> <p><i>If yes:</i></p> <p>2) Is deep or flat steaming performed?</p>
247	<p>Hybrid cultivars</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Permanent grassland, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm decline to cultivate hybrid cultivars?</p>
320	<p>Crop resistance</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Are cultivars chosen with a view to resistance to harmful organisms and diseases?</p>
201	<p>Slurry application with drag hose system or by injection</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Permanent grassland, Tree nursery / perennials</p>	<p><i>Only ask/rate if slurry occurs:</i></p> <p>On what proportion of the agricultural area does the farm use drag hose or injection systems to apply slurry?</p>
257,2	<p>Pesticides: Toxicity aquatic organisms</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered to be toxic to aquatic organisms according to the "PAN Pesticide Database"?</p> <p><i>The strongest impact on organisms of all active ingredients used is assessed</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
257,1	<p>Pesticides: Toxicity bees</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered toxic to bees according to the "PAN Pesticide Database"?</p> <p><i>The strongest impact on bees of all active ingredients used is assessed</i></p>
474,1	<p>Pesticides: Persistence water</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered very persistent in water (half-life > 60 days) according to the "PAN Pesticide Database"?</p>
474,2	<p>Pesticides: Persistence soil</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered to be very persistent in soil (half-life > 180 days) according to the "PAN Pesticide Database"?</p>
740	<p>Growth regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm decline to use synthetic chemical growth regulators?</p>
619,1	<p>Proportion drained arable land which is not on moorland</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	<p>What is the proportion of drained arable land that is not on moorland (including peatland, wetland)?</p> <p><i>Comment: Consider all dewatering measures of the past 20 years (e.g. draining, trenching)</i></p>
618,1	<p>Proportion drained permanent grassland which is not on moorland</p> <p>Relevant for farms with the following activities: Permanent grassland, Tropical crops</p>	<p>What is the proportion of drained grassland that is not on moorland (including peatland, wetland)?</p> <p><i>Comment: Consider all dewatering measures of the past 20 years (e.g. draining, trenching)</i></p>
739	<p>Reusable packaging materials</p> <p>Relevant for farms with the following activities: Vegetable production, Fruit production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>Does the farm use reusable and multiple-use packaging?</p> <p><i>Consider buying and selling.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
72	<p>Further training for farm staff</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How many days of further education or training (per person) were taken during the last year (including farm manager and employees)?</p> <p><i>Further training: External person on the farm or participation in external, thematic events (excluding trade shows!).</i></p> <p><i>Total number of days spent for further training during last year on average per person.</i></p>
412	<p>Employees: Access to external training</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the employees had access to external training in the past 5 years (at least 1 training course)? How does the farm financially support this?</p> <p><i>Account for all employees, for which an external training was financed.</i></p>
119	<p>Apprenticeships</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are apprenticeships and/or traineeships regularly offered on the farm?</p> <p><i>Ratio of numbers of apprenticeships and other training opportunities to full time equivalent employees.</i></p>
73	<p>Long term investments</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Has the farm invested in long-term improvements to infrastructure (buildings, roads) or in the purchase of further productive land in the last 10 years?</p>
770	<p>Farm savings</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have adequate savings to cater for its cash needs?</p>

Tab. S33 SMART Indicators for the Sub-Theme “Profitability”

Indicator number	Indicator name (Relevance)	Indicator description
775	<p>Total size (acreage) of main crops Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Tropical crops</p>	<p>Does the farm main business unit(s) have a commercially viable size which generates sufficient revenues to cover both direct and indirect costs as well as further investments?</p>
700	<p>Measures to prevent erosion Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>Are sufficient measures taken on agricultural areas (excluding permanent grassland) with sloping gradients lower than 15 % to prevent erosion? <i>Consider: cropping techniques, type of crop, gradients, weather conditions (wind, rainfall etc.).</i></p>
368	<p>Stocking density Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Are stocking densities in the housing system (animals/m² of floor space) adequate (sufficient space for movements and to avoid animal injuries and stress due to conflicts) for all livestock categories?</p>
789	<p>On farm mechanization grade Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>To what extent is the physical workload on the farm reduced due to the degree of mechanization?</p>
628	<p>Mechanization: Milking Relevant for farms with the following activities: Dairy cattle / Goats / Sheep</p>	<p>To what extent does mechanization reduce the physical workload when milking?</p>
257	<p>Arable land: Average plot size Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What is the average plot size of the farm’s arable land?</p>
244	<p>Number of scattered fruit trees Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How many scattered fruit trees does the farm have (trees per ha agricultural area)?</p>

Indicator number	Indicator name (Relevance)	Indicator description
202	<p>Agro-forestry systems</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the farm's agricultural area is devoted to agro-forestry systems?
208	<p>Woodlands: Share of agricultural land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the farmland (all area types of the farm) is woodland?
204	<p>Woodlands: Deforestation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Which portion of the farm's current agricultural area has been deforested over the past 20 years?</p> <p><i>Remark: deforestation = removal of a forest or stand of trees were the land is thereafter converted to a non-forest use.</i></p>
215	<p>Arable land: Share of temporary grasslands</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	What proportion of the arable land is devoted to temporary grassland (grass-clover, ley, alfalfa etc.)?
219	<p>Arable land: Under sown crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	What proportion of the arable land has cover crops under sown?
601	<p>Permanent grasslands: Conversion</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Viticulture, Tropical crops</p>	What proportion of permanent grasslands has been converted to arable land in the past 5 years?
620	<p>Permanent grasslands: Mowing frequency</p> <p>Relevant for farms with the following activities: Permanent grassland</p>	How often is the grassland mowed on average?

Indicator number	Indicator name (Relevance)	Indicator description
296	<p>Soil degradation: Share of agricultural area</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Pig production, Poultry production, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the agricultural area has been degraded over the last 20 years or can no longer be used for farming?</p>
281	<p>Soil degradation: Severe soil compaction</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>On what proportion of the agricultural area has been signs of severe soil compaction (caused by either machinery or livestock)?</p>
606	<p>Landslides and mudslides on agricultural area</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Tropical crops</p>	<p>Were there landslides and/or local mudslides on the farms agricultural area in the past 10 years?</p>
741	<p>Steaming on open ground</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>1) Is soil steaming performed on open ground? <i>If yes:</i> 2) Is deep or flat steaming performed?</p>
742	<p>Steaming in the greenhouse</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>1) Is soil steaming performed in the greenhouse? <i>If yes:</i> 2) Is deep or flat steaming performed?</p>
749	<p>Soil disinfection</p> <p>Relevant for farms with the following activities: Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>1) On which proportion of the agricultural area are soil disinfection chemicals (e.g. fumigation) applied? <i>If no:</i> 2) Is documentation and justification for the use of soil disinfection products available?</p>
784	<p>Weed management</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tropical crops</p>	<p>Are weeds controlled to optimize nutrient and water uptake of the crop as well as spread of pests and diseases?</p>

Indicator number	Indicator name (Relevance)	Indicator description
223	<p>Rare or endangered agricultural crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>How many rare or endangered agricultural crops are grown on the farm? <i>Including crop species and cultivars.</i></p>
247	<p>Hybrid cultivars</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Permanent grassland, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm decline to cultivate hybrid cultivars?</p>
782	<p>Use of clean planting materials</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tropical crops</p>	<p>Are seeds and planting materials obtained from external sources controlled/certified to ensure high levels of seed health, cleanness and germination? If seeds are not officially certified they should be checked in accordance with the rules of the International Seed Testing Association (ISTA).</p>
320	<p>Crop resistance</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Are cultivars chosen with a view to resistance to harmful organisms and diseases?</p>
775,1	<p>Maintenance of crop fields</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Tropical crops</p>	<p>Is the main crop properly maintained in the field? <i>E.g. heavy pruning, training, stumping, and/or replanting is performed on low producing and unproductive plantations to promote an optimal yield</i></p>
290	<p>Determining fertilizer requirements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When determining fertilizer requirements, are soil analysis results and/or leaf-analysis considered? <i>Soil analyses: Once every 5 years: pH, P and K / Annually: N min</i></p>
308	<p>Farmyard manure</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion (volume) of the organic fertilizer used is farmyard manure?</p>

Indicator number	Indicator name (Relevance)	Indicator description
708	<p>Precise fertilisation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farm use systems for precise fertilisation (e.g. variable rate application methods, drip irrigation with mineral fertilisers)?
231	<p>No use of synth. chem. herbicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the agricultural area does not receive synthetic chemical herbicide applications?
234	<p>No use of synth. chem. insecticides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	What proportion of the agricultural area does not receive synthetic chemical insecticide applications? <i>Spinosad, Neem and other broad-range organic insecticides count.</i>
740	<p>Growth regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farm decline to use synthetic chemical growth regulators ?
747	<p>Flowering regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farm use products to influence the flowering of plants or for desiccation ? <i>Rate positive for nature identical ethylene gas.</i>
785	<p>Soil water harvesting</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tropical crops</p>	Are adequate measures taken to improve rain water harvesting into the soil?
400	<p>Yield decreases resulting from lack of water</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Were yields limited during the past 5 years as a result of lack of water (more than 20% reduction either in livestock and/or crop production yield)?

Indicator number	Indicator name (Relevance)	Indicator description
128,1	<p>Yield level</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How are the farm's yields compared to the yields of neighbouring farms?</p> <p><i>All products are meant here including milk, honey, fish etc.</i></p> <p><i>If farmer is not sure: look up regional average yields.</i></p>
128,2	<p>Yield tendency</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How have the yields developed in the past 5 years (rising, falling (+/- 5%) or stable)?</p> <p><i>Refer to the 3 most profitable products (animals and plants)</i></p>
95	<p>Yield loss</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Has the farm been affected by crop failures (> 20% of expected yields) in the past 5 years?</p>
337	<p>Loss of agricultural products (food waste)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture, Tropical crops</p>	<p>On average, what proportion of the food produced on the farm had to be disposed of over the past 5 years?</p>
357	<p>Mutilation: Use of anaesthetics and analgesics</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Dairy cattle / Goats / Sheep</p>	<p>Are anaesthetics and analgesics used when animals are mutilated?</p>
612	<p>Proportion of lameness animals</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep</p>	<p>What is the proportion of lame animals?</p>
716	<p>Losses of calves</p> <p>Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep</p>	<p>How high was the loss of calves (calves up to 65 kg) in the past year?</p>

Indicator number	Indicator name (Relevance)	Indicator description
724	Fattening pigs: Losses Relevant for farms with the following activities: Pig production	How high was the loss of fattening pigs (in %) in the past year?
727	Losses of piglets Relevant for farms with the following activities: Pig production	How high is the loss of piglets (up to 25 kg) incl. stillbirths (average of the past 5 years)?
190	Biogas plant: share organic residues Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	What proportion of organic matter - that is a surplus or leftover from food/feed production - is utilized in a biogas plant (own or external plant)?
195	Energy-efficient driving (Eco-Drive) Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	Do the farm manager and the employees use energy-efficient driving techniques (e.g. Eco-Drive advice: low speed of engine (revolutions per minute) and driving with high gears if possible etc.)?
192	Plants for energy production instead of human consumption Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	<i>If a farm uses plant materials for energy production:</i> What part of the substrate used for energy production would also be suitable for human consumption?
196	Insulation of heated farm buildings Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	<i>If there are heated farm buildings:</i> What proportion of the heated farm buildings are sufficiently insulated (e.g. with double or multiple glazed windows, roof / wall / floor insulation)? <i>Do not score heated greenhouses, covered in ID 745</i>

Indicator number	Indicator name (Relevance)	Indicator description
345	<p>Irrigation: Low energy technology and pumps</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p><i>Only ask/rate if irrigation is used:</i></p> <p>Does the farm use low-energy irrigation technology and pumps, drip irrigation and micro irrigation?</p> <p><i>Score positively if it is done manually</i></p>
100	<p>Market challenges</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the farmer aware and informed about future market challenges?</p>
101	<p>Political / Policy challenges</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the farmer aware and informed about future policy changes / political challenges?</p>
134	<p>Knowledge of climate change problems</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm manager know the predictions for climate changes in the region resulting from global climate change and can he judge the impact on the farm?</p>
136	<p>Climate change adaptation measures</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>Only score if there are negative climate-related predictions:</i></p> <p>Is the farm taking steps to adapt to the consequences of climate change?</p>

Indicator number	Indicator name (Relevance)	Indicator description
88	<p>Secure supply of farm inputs</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Have there been any occasions in the last 5 years when necessary farm inputs were not available, and which in turn resulted in production losses?</p> <p><i>Example: There were no seeds available.</i></p>
776	<p>Harvesting methods</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tropical crops</p>	<p>Are products harvested at the appropriate time and using the best method for optimizing quality and crop health?</p>
777	<p>Storage facilities</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tropical crops</p>	<p>Are storage facilities and equipment kept clean, pest and water leak proof, with good ventilation, stored off-ground, away from the walls and not together with chemicals?</p>
161	<p>Producer price vs. market price level</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How many percentage points do the average prices of the farm's main products deviate from the average market price?</p> <p><i>1) Rank the most important products according to their share on gross sales value.</i></p> <p><i>2) For the most important products which account for at least 60% of the gross sales value, calculate the deviation from the market price in percentage (find out the regional market price either before or after the interview).</i></p> <p><i>3) Calculate the weighted average according to the product's share on gross sales value.</i></p>
145	<p>On farm processing</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the sales comes from processed products?</p> <p><i>If necessary estimated.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
74	<p>Environmental involvement outside the farm: Costs</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is the farm involved in environmental protection (not paid for), besides its own land? If yes, how many days per year are taken for such projects?
75	<p>Social involvement outside the farm: Costs</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is the farm involved in social matters (not paid for) in the community? If yes, how many days on average per year are taken for this commitment?
0	<p>Professional agricultural accounts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have a professional agricultural accounting procedure that is also used for the farm management?</p> <p><i>Rate "partly" if the professional accounts are not used for the farm management.</i></p>
155	<p>Insurance: Fire</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is the farm insured against fire damage?
156	<p>Insurance: Natural disasters</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is the farm insured against natural disasters relevant to the region (flooding, landslides, drought etc.)?

Indicator number	Indicator name (Relevance)	Indicator description
99	<p>Profit stability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Has the farm's profit been rising, stable or falling in the last 5 years?
73	<p>Long term investments</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Has the farm invested in long-term improvements to infrastructure (buildings, roads) or in the purchase of further productive land in the last 10 years?
153	<p>Problems with loan providers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	In the last 5 years, have there been problems with lenders?
70	<p>Cooperation with ethical financial institutions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Does the farm cooperate with ethical banks? <i>E.g. Alternative Bank (CH), GLS (DE); do not rate if there is no cooperation with a bank.</i>
158	<p>Diversification of income</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	How many other sources of income (related to agriculture and which contribute more than 10% of farmer's income) exist on the farm besides farming? <i>Examples: Services, Agro-tourism, etc.</i>
768	<p>Collective marketing</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture, Tropical crops</p>	Is the farm involved in collective marketing with other farmers?

Tab. S34 SMART Indicators for the Sub-Theme “Stability of Production”

Indicator number	Indicator name (Relevance)	Indicator description
253	<p>Permanent grasslands: Extensively managed</p> <p>Relevant for farms with the following activities: Arable farming, Permanent grassland, Beef cattle, Pig production, Poultry production, Tropical crops</p>	<p>What proportion of the area of permanent grassland is under extensive management?</p> <p>Extensive means: double mowing/grazing or less, zero application of fertilizers / pesticides</p>
775	<p>Total size (acreage) of main crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Tropical crops</p>	<p>Does the farm main business unit(s) have a commercially viable size which generates sufficient revenues to cover both direct and indirect costs as well as further investments?</p>
206	<p>Share of legumes on arable land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the arable land is devoted to leguminous crops?</p>
764	<p>Share of legumes on perennial crops area</p> <p>Relevant for farms with the following activities: Fruit production, Viticulture, Tree nursery / perennials</p>	<p>What proportion of the perennial crops area is devoted to legumes?</p>
700	<p>Measures to prevent erosion</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>Are sufficient measures taken on agricultural areas (excluding permanent grassland) with sloping gradients lower than 15 % to prevent erosion?</p> <p><i>Consider: cropping techniques, type of crop, gradients, weather conditions (wind, rainfall etc.).</i></p>
712	<p>Bought-in organic fertilisers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>What proportion of the entire organic fertilisers used is externally sourced?</p> <p><i>In the past 5 years - average per year?</i></p> <p><i>Green manure not counted in calculation</i></p>
199	<p>Bought-in concentrated feed</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>What proportion of the concentrate feed used on the farm is sourced externally?</p>
705	<p>Substrate (Soilless) production</p> <p>Relevant for farms with the following activities: Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>Does the farm have substrate (soilless) production systems?</p> <p><i>Example: substrate, hydroponics.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
368	<p>Stocking density</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Are stocking densities in the housing system (animals/m² of floor space) adequate (sufficient space for movements and to avoid animal injuries and stress due to conflicts) for all livestock categories?</p>
369	<p>Number and quality of drinking points</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep</p>	<p>Are there sufficient numbers of clean, functioning drinking points for all livestock categories? Score negative if distance is >300m (for ruminants)</p>
720	<p>Silage storage</p> <p>Relevant for farms with the following activities: Permanent grassland, Beef cattle, Pig production, Dairy cattle / Goats / Sheep</p>	<p>Is the silage stored appropriately to minimize losses and avoid contamination?</p>
721	<p>Storage of feed concentrate</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Is the feed concentrate stored appropriately to minimize losses and avoid contamination?</p>
722	<p>Injuries of pigs</p> <p>Relevant for farms with the following activities: Pig production</p>	<p>What is the proportion of pigs with abrasions, bite wounds, scuffing marks, scratches, abscesses, injuries and wounds (incl. tails and ears)?</p>
130	<p>Condition of farm infrastructure</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What is the general condition of the farm infrastructure (buildings, installations, machinery and vehicles necessary to maintain proper functioning of the farm)?</p>
186	<p>On-farm renewable energy production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the electricity consumed is generated by the farm's own installations that are run with renewable sources?</p>

Indicator number	Indicator name (Relevance)	Indicator description
288	<p>Arable land: Erosion control > 15 %</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Tropical crops</p>	<p>Are sufficient measures taken on agricultural areas (excluding permanent grassland) with sloping gradients higher than 15 % (up to 30%) to prevent erosion (e.g. contour ploughing)?</p>
299	<p>Arable land: Green cover > 30 %</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Care is taken on agricultural areas with sloping gradients higher than 30 % to ensure a good, continuous green cover (under sown crops, catch crops etc.)?</p>
767	<p>Land ownership</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farmer have secure tenure rights over the land for at least 10 years?</p>
744	<p>On farm Biodiversity promotion</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Are beneficial organisms on the farm protected and promoted?</p>
244	<p>Number of scattered fruit trees</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How many scattered fruit trees does the farm have (trees per ha agricultural area)?</p>
202	<p>Agro-forestry systems</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the farm's agricultural area is devoted to agro-forestry systems?</p>

Indicator number	Indicator name (Relevance)	Indicator description
208	<p>Woodlands: Share of agricultural land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the farmland (all area types of the farm) is woodland?</p>
236	<p>Number of elements in crop rotation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>How many elements does the crop rotation consist of?</p> <p><i>Count perennial clover grass as one crop</i></p>
758	<p>Number of perennial crops</p> <p>Relevant for farms with the following activities: Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>How many different perennial crops are grown on the farm's agricultural area?</p> <p><i>Count perennial crops if more than 10% of agricultural area.</i></p>
215	<p>Arable land: Share of temporary grasslands</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>What proportion of the arable land is devoted to temporary grassland (grass-clover, ley, alfalfa etc.)?</p>
285	<p>Humus Formation: Catch Crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>On what proportion of the arable land are catch crops grown?</p>
225	<p>Arable land: Share of green cover outside growing period</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>What proportion of the arable land is covered by vegetation outside the growing period?</p> <p><i>EU: Period between 15. November und 15. February.</i></p>
207	<p>Arable land: Share of direct seeding</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tropical crops</p>	<p>What proportion of the arable land is managed by the method of direct seeding?</p>
219	<p>Arable land: Under sown crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	<p>What proportion of the arable land has cover crops under sown?</p>

Indicator number	Indicator name (Relevance)	Indicator description
620	<p>Permanent grasslands: Mowing frequency</p> <p>Relevant for farms with the following activities: Permanent grassland</p>	How often is the grassland mowed on average?
296	<p>Soil degradation: Share of agricultural area</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Pig production, Poultry production, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the agricultural area has been degraded over the last 20 years or can no longer be used for farming?
286	<p>Soil degradation: Measures taken to counter</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	On what proportion of the agricultural area are measures taken to combat relevant soil degradation processes on the farm (e.g. compaction, pollution)? <i>Do not consider erosion (already covered in other indicators), see list of examples, award full points if no degradation processes are evident.</i>
281	<p>Soil degradation: Severe soil compaction</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	On what proportion of the agricultural area has been signs of severe soil compaction (caused by either machinery or livestock)?
298	<p>Soil improvement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of formerly degraded lands (not suitable for farming) has been regenerated over the past 20 years and can again be used for farming? <i>Measures include e.g. compost applications, liming, fertilizer applications</i> <i>Full score for completely fertile soils</i>
606	<p>Landslides and mudslides on agricultural area</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Tropical crops</p>	Were there landslides and/or local mudslides on the farms agricultural area in the past 10 years?

Indicator number	Indicator name (Relevance)	Indicator description
748	<p>Humus Formation: Humus balance</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	<p>1) Is the humus balance calculated?</p> <p>2) Is the humus balance positive, balanced or negative on average? <i>In case of small farms, check whether the farmer focuses on practices that improve humus balance</i></p>
784	<p>Weed management</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tropical crops</p>	<p>Are weeds controlled to optimize nutrient and water uptake of the crop as well as spread of pests and diseases?</p>
782	<p>Use of clean planting materials</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tropical crops</p>	<p>Are seeds and planting materials obtained from external sources controlled/certified to ensure high levels of seed health, cleanness and germination? If seeds are not officially certified they should be checked in accordance with the rules of the International Seed Testing Association (ISTA).</p>
320	<p>Crop resistance</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Are cultivars chosen with a view to resistance to harmful organisms and diseases?</p>
775,1	<p>Maintenance of crop fields</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Tropical crops</p>	<p>Is the main crop properly maintained in the field? <i>E.g. heavy pruning, training, stumping, and/or replanting is performed on low producing and unproductive plantations to promote an optimal yield</i></p>
290	<p>Determining fertilizer requirements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When determining fertilizer requirements, are soil analysis results and/or leaf-analysis considered? <i>Soil analyses: Once every 5 years: pH, P and K / Annually: N min</i></p>
323	<p>Mineral N fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What is the farm's mineral N fertilizer (in kg) usage per hectare per year on its agricultural area?</p>

Indicator number	Indicator name (Relevance)	Indicator description
324	<p>Mineral P fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What is the farm's total easily dissolvable mineral P fertilizer usage (P₂O₅ in kg) per hectare per year (active P ingredients) on its agricultural area?</p>
322	<p>Mineral K fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is mineral Potassium fertilizer used in a needs-oriented way on the farm's agricultural area? <i>Rate "needs-oriented" if Potassium fertilizer isn't applied with good reason and if there is at the same time no Potassium deficiency.</i></p>
708	<p>Precise fertilisation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm use systems for precise fertilisation (e.g. variable rate application methods, drip irrigation with mineral fertilisers)?</p>
231	<p>No use of synth. chem. herbicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the agricultural area does not receive synthetic chemical herbicide applications?</p>
233	<p>No use of synth. chem. fungicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the agricultural area does not receive synthetic chemical fungicide applications?</p>
234	<p>No use of synth. chem. insecticides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the agricultural area does not receive synthetic chemical insecticide applications? <i>Spinosad, Neem and other broad-range organic insecticides count.</i></p>
740	<p>Growth regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm decline to use synthetic chemical growth regulators?</p>

Indicator number	Indicator name (Relevance)	Indicator description
747	<p>Flowering regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm use products to influence the flowering of plants or for desiccation?</p> <p><i>Rate positive for nature identical ethylene gas.</i></p>
785	<p>Soil water harvesting</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tropical crops</p>	<p>Are adequate measures taken to improve rain water harvesting into the soil?</p>
400	<p>Yield decreases resulting from lack of water</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Were yields limited during the past 5 years as a result of lack of water (more than 20% reduction either in livestock and/or crop production yield)?</p>
405	<p>Water storage capacity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do sufficient capacities exist for water storage on the farm (retention basins, cisterns)?</p>
619,1	<p>Proportion drained arable land which is not on moorland</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	<p>What is the proportion of drained arable land that is not on moorland (including peatland, wetland)?</p> <p><i>Comment: Consider all dewatering measures of the past 20 years (e.g. draining, trenching)</i></p>
618,1	<p>Proportion drained permanent grassland which is not on moorland</p> <p>Relevant for farms with the following activities: Permanent grassland, Tropical crops</p>	<p>What is the proportion of drained grassland that is not on moorland (including peatland, wetland)?</p> <p><i>Comment: Consider all dewatering measures of the past 20 years (e.g. draining, trenching)</i></p>
128,2	<p>Yield tendency</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How have the yields developed in the past 5 years (rising, falling (+/- 5%) or stable)?</p> <p><i>Refer to the 3 most profitable products (animals and plants)</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
95	Yield loss Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	Has the farm been affected by crop failures (> 20% of expected yields) in the past 5 years?
337	Loss of agricultural products (food waste) Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture, Tropical crops	On average, what proportion of the food produced on the farm had to be disposed of over the past 5 years?
159,5	Average number of lactations Relevant for farms with the following activities: Dairy cattle / Goats / Sheep	What is the average number of lactations of the dairy animals?
614	Complaints regarding exceeded cell counts Relevant for farms with the following activities: Dairy cattle / Goats / Sheep	Were there any complaints from dairy manufacturers regarding exceeded cell counts in the past 5 years?
198	Dual-purpose breeds: Ruminants Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	What proportion of the ruminants are dual-purpose breeds? <i>Any dual-purpose breed that is only kept for one purpose (e.g. meat only/dairy only) does not count as a dual-purpose breed.</i>
198,1	Dual-purpose breeds: chickens Relevant for farms with the following activities: Poultry production	What proportion of the chickens are dual-purpose breeds? <i>Any dual-purpose breed that is only kept for one purpose (e.g. meat only/eggs only) does not count as a dual-purpose breed.</i>
245	Locally adapted livestock breeds Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture	Are locally adapted livestock breeds kept on the farm?
249	Hybrid livestock (poultry, pigs) Relevant for farms with the following activities: Pig production, Poultry production, Bees, Aquaculture	Does the farm keep hybrid livestock (of poultry or pigs)?

Indicator number	Indicator name (Relevance)	Indicator description
352	Livestock health: Proportion of curative treatments Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture	What proportion of the animals (across all livestock categories) received curative antibiotics treatments (for actual illnesses) during the last year?
358	Cattle: Losses Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	How high was the loss of cows/beef in the past year?
358,1	Poultry: Losses Relevant for farms with the following activities: Poultry production	How high was average monthly loss of poultry in the past year? <i>Score based on poultry category with highest loss rate</i>
716	Losses of calves Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	How high was the loss of calves (calves up to 65 kg) in the past year?
724	Fattening pigs: Losses Relevant for farms with the following activities: Pig production	How high was the loss of fattening pigs (in %) in the past year?
727	Losses of piglets Relevant for farms with the following activities: Pig production	How high is the loss of piglets (up to 25 kg) incl. stillbirths (average of the past 5 years)?
188	Share of fuel from own production Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	Which proportion of the fuel used for farm vehicles and machinery is produced on-farm ?
203	On-farm renewable heat production Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture	What proportion of the heating-energy used is generated by the farm's own installations that are run with renewable sources (wood chips, geothermal, solar)?

Indicator number	Indicator name (Relevance)	Indicator description
100	<p>Market challenges</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is the farmer aware and informed about future market challenges?
101	<p>Political / Policy challenges</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is the farmer aware and informed about future policy changes / political challenges?
134	<p>Knowledge of climate change problems</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Does the farm manager know the predictions for climate changes in the region resulting from global climate change and can he judge the impact on the farm?
136	<p>Climate change adaptation measures</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>Only score if there are negative climate-related predictions:</i></p> <p>Is the farm taking steps to adapt to the consequences of climate change?</p>
627	<p>Cooperation with other farms</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm successfully, and in the long term, cooperate with other farms?</p> <p><i>Exclude cooperation in marketing (indicator 768).</i></p>
776	<p>Harvesting methods</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tropical crops</p>	Are products harvested at the appropriate time and using the best method for optimizing quality and crop health?

Indicator number	Indicator name (Relevance)	Indicator description
777	<p>Storage facilities</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tropical crops</p>	<p>Are storage facilities and equipment kept clean, pest and water leak proof, with good ventilation, stored off-ground, away from the walls and not together with chemicals?</p>
707	<p>Customer relationship</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture</p>	<p>Does the farm cooperate with customers / buyers? Examples: Common product development, production planning, advisory service from the buyer, etc.</p>
124	<p>Guaranteed staff replacement: Farm succession</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the farm succession secured? <i>Do not ask farm managers below 55 years of age.</i></p>
97	<p>Staff shortages</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Have there been staff shortages in the last five years that could not be resolved? <i>Examples: Due to additional staff requirements during peak periods, replacement of senior staff members etc.</i></p>
159	<p>Staff turnover</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>In the last 5 years, how many staff changes have there been among the permanent employees of the farm? <i>Where > 20% of employees: Ask for reasons.</i></p>
623	<p>Availability of adequate replacement of farm manager</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm manager/farmer have an adequate replacement who is familiar with the farm (e.g. taking care of the animals) in case of illness or holidays?</p>

Indicator number	Indicator name (Relevance)	Indicator description
456,5	<p>Clear ownership rights / social protection for partners in the event of divorce / death</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are the spouse and other dependent relatives of the farm manager provided for in the event of his or her death or in case of divorce (clear ownership rights, etc.)?</p> <p><i>Focus on social security, not on the continuity of farming.</i></p>
469	<p>Management system for workplace safety and health</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a professional management system for workplace safety and health in place to reduce the risk of injuries and illnesses relating to work?</p>
703	<p>Access to advisory services</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have adequate access to advisory services?</p>
155	<p>Insurance: Fire</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the farm insured against fire damage?</p>
156	<p>Insurance: Natural disasters</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the farm insured against natural disasters relevant to the region (flooding, landslides, drought etc.)?</p>

Indicator number	Indicator name (Relevance)	Indicator description
151	<p>Debt</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What is the proportion of the farm's own capital?</p>
770	<p>Farm savings</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have adequate savings to cater for its cash needs?</p>
152	<p>Credit limit</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How much more credit can the farm access if needed?</p> <p><i>% of current debt</i></p> <p><i>Estimation</i></p>
153	<p>Problems with loan providers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>In the last 5 years, have there been problems with lenders?</p>
158	<p>Diversification of income</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How many other sources of income (related to agriculture and which contribute more than 10% of farmer's income) exist on the farm besides farming?</p> <p><i>Examples: Services, Agro-tourism, etc.</i></p>

Tab. S35

SMART Indicators for the Sub-Theme “Stability of Supply”

Indicator number	Indicator name (Relevance)	Indicator description
712	<p>Bought-in organic fertilisers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>What proportion of the entire organic fertilisers used is externally sourced?</p> <p><i>In the past 5 years - average per year?</i></p> <p><i>Green manure not counted in calculation</i></p>
199	<p>Bought-in concentrated feed</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>What proportion of the concentrate feed used on the farm is sourced externally?</p>
186	<p>On-farm renewable energy production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the electricity consumed is generated by the farm's own installations that are run with renewable sources?</p>
247	<p>Hybrid cultivars</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Permanent grassland, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm decline to cultivate hybrid cultivars?</p>
323	<p>Mineral N fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What is the farm's mineral N fertilizer (in kg) usage per hectare per year on its agricultural area?</p>
324	<p>Mineral P fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What is the farm's total easily dissolvable mineral P fertilizer usage (P_2O_5 in kg) per hectare per year (active P ingredients) on its agricultural area?</p>
322	<p>Mineral K fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is mineral Potassium fertilizer used in a needs-oriented way on the farm's agricultural area?</p> <p><i>Rate "needs-oriented" if Potassium fertilizer isn't applied with good reason and if there is at the same time no Potassium deficiency.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
708	<p>Precise fertilisation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farm use systems for precise fertilisation (e.g. variable rate application methods, drip irrigation with mineral fertilisers)?
231	<p>No use of synth. chem. herbicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the agricultural area does not receive synthetic chemical herbicide applications?
233	<p>No use of synth. chem. fungicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	What proportion of the agricultural area does not receive synthetic chemical fungicide applications?
234	<p>No use of synth. chem. insecticides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	What proportion of the agricultural area does not receive synthetic chemical insecticide applications? <i>Spinosad, Neem and other broad-range organic insecticides count.</i>
740	<p>Growth regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farm decline to use synthetic chemical growth regulators ?
747	<p>Flowering regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farm use products to influence the flowering of plants or for desiccation ? <i>Rate positive for nature identical ethylene gas.</i>
626	<p>Proportion bought-in roughage</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Dairy cattle / Goats / Sheep</p>	Which proportion of the used roughage is sourced externally?

Indicator number	Indicator name (Relevance)	Indicator description
188	<p>Share of fuel from own production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Which proportion of the fuel used for farm vehicles and machinery is produced on-farm ?
192	<p>Plants for energy production instead of human consumption</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<i>If a farm uses plant materials for energy production:</i> What part of the substrate used for energy production would also be suitable for human consumption?
196	<p>Insulation of heated farm buildings</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<i>If there are heated farm buildings:</i> What proportion of the heated farm buildings are sufficiently insulated (e.g. with double or multiple glazed windows, roof / wall / floor insulation)? <i>Do not score heated greenhouses, covered in ID 745</i>
203	<p>On-farm renewable heat production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture</p>	What proportion of the heating-energy used is generated by the farm's own installations that are run with renewable sources (wood chips, geothermal, solar)?
345	<p>Irrigation: Low energy technology and pumps</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<i>Only ask/rate if irrigation is used:</i> Does the farm use low-energy irrigation technology and pumps, drip irrigation and micro irrigation? <i>Score positively if it is done manually</i>

Indicator number	Indicator name (Relevance)	Indicator description
93	<p>Quality of cooperation with suppliers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of farm inputs comes from contracted suppliers or stable long-term suppliers (estimate)?</p> <p><i>Suppliers: Shops, sales agents etc. Estimate value of inputs purchased from contracted/stable suppliers as a percentage of the total inputs bought in (value terms). Go through all different inputs separately (Seeds, fuel, fertilizer etc.). Ask in clusters 0-20% / 20-40%...</i></p>
88	<p>Secure supply of farm inputs</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Have there been any occasions in the last 5 years when necessary farm inputs were not available, and which in turn resulted in production losses?</p> <p><i>Example: There were no seeds available.</i></p>
439	<p>Forced labour at suppliers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that suppliers of the farm (other operations within the farm's sphere of influence) were involved in any incidences of forced labour in the past 10 years? <i>Problematic regions according to ILO [> 3%]: Non-EU-countries in Eastern Europe, Middle-East, Africa, Latin America, Caribbean and Pacific.</i></p>
703	<p>Access to advisory services</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have adequate access to advisory services?</p>

Tab. S36

SMART Indicators for the Sub-Theme "Stability of Market"

Indicator number	Indicator name (Relevance)	Indicator description
244	<p>Number of scattered fruit trees</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	How many scattered fruit trees does the farm have (trees per ha agricultural area)?
202	<p>Agro-forestry systems</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the farm's agricultural area is devoted to agro-forestry systems?
208	<p>Woodlands: Share of agricultural land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the farmland (all area types of the farm) is woodland?
521	<p>Production of bioenergy crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tropical crops</p>	On what proportion of the farm's agricultural area bioenergy crops are produced?
520	<p>Production of fibre crops</p> <p>Relevant for farms with the following activities: Arable farming, Tropical crops</p>	On what proportion of the farm's arable land natural fibre crops (cotton, sisal, flax, hemp etc.) are produced?
601	<p>Permanent grasslands: Conversion</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Viticulture, Tropical crops</p>	What proportion of permanent grasslands has been converted to arable land in the past 5 years?
298	<p>Soil improvement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of formerly degraded lands (not suitable for farming) has been regenerated over the past 20 years and can again be used for farming?</p> <p><i>Measures include e.g. compost applications, liming, fertilizer applications</i></p> <p><i>Full score for completely fertile soils</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
223	<p>Rare or endangered agricultural crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>How many rare or endangered agricultural crops are grown on the farm?</p> <p><i>Including crop species and cultivars.</i></p>
775,1	<p>Maintenance of crop fields</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Tropical crops</p>	<p>Is the main crop properly maintained in the field?</p> <p><i>E.g. heavy pruning, training, stumping, and/or replanting is performed on low producing and unproductive plantations to promote an optimal yield</i></p>
614	<p>Complaints regarding exceeded cell counts</p> <p>Relevant for farms with the following activities: Dairy cattle / Goats / Sheep</p>	<p>Were there any complaints from dairy manufacturers regarding exceeded cell counts in the past 5 years?</p>
146	<p>Product returns</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>In the past 5 years, have any products been returned or rejected by buyers due to poor quality?</p>
167	<p>Contaminated products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Have any contaminated products returned to the farm in the last 5 years that posed a risk for food safety?</p>
83	<p>Diversification of sales</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>To how many customers does the farm sell its products (besides direct sales to private individuals; e.g. wholesalers)?</p>
751	<p>Dependency on main customer</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of sales profit, in terms of income, does the most important buyer generate?</p> <p><i>Direct payments excluded, only revenue from product sales is relevant. Not relevant for 100% direct sales (separate indicator).</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
149	<p>Length of customer relationships</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>On average, for how many years has the farm been selling its products to the present customers?</p> <p>1) Rank the most important buyers according to their share on farmer's income (take direct sales as one buyer).</p> <p>2) For the most important buyers, which account for at least 60% of the farmer's income, ask for the number of years.</p> <p>3) Calculate the weighted average according to the buyer's share on farmer's income.</p>
141	<p>Direct sales</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are there direct (on-the-farm, farmer's market) sales?</p> <p>If yes: What proportion of the farm's income comes from direct sales?</p> <p><i>If necessary estimated.</i></p>
84	<p>Availability of alternative markets</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are there alternative markets for all products if buyers drop out?</p>
175	<p>Transparency of production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are details of production methods at the farm transparent and available to buyers?</p> <p><i>E.g. through participation in programmes such as "www.Bio-mit-Gesicht.de" (products are traceable through numbers for the consumer). In the case of direct sales, check the website for information on the production (inputs, practices, labels etc.).</i></p>
707	<p>Customer relationship</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture</p>	<p>Does the farm cooperate with customers / buyers?</p> <p>Examples: Common product development, production planning, advisory service from the buyer, etc.</p>

Indicator number	Indicator name (Relevance)	Indicator description
703	<p>Access to advisory services</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Does the farm have adequate access to advisory services?
158	<p>Diversification of income</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	How many other sources of income (related to agriculture and which contribute more than 10% of farmer's income) exist on the farm besides farming? <i>Examples: Services, Agro-tourism, etc.</i>
768	<p>Collective marketing</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture, Tropical crops</p>	Is the farm involved in collective marketing with other farmers?

Tab. S37 SMART Indicators for the Sub-Theme "Liquidity"

Indicator number	Indicator name (Relevance)	Indicator description
128,1	<p>Yield level</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	How are the farm's yields compared to the yields of neighbouring farms? <i>All products are meant here including milk, honey, fish etc.</i> <i>If farmer is not sure: look up regional average yields.</i>
155	<p>Insurance: Fire</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is the farm insured against fire damage?

Indicator number	Indicator name (Relevance)	Indicator description
156	<p>Insurance: Natural disasters</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is the farm insured against natural disasters relevant to the region (flooding, landslides, drought etc.)?
99	<p>Profit stability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Has the farm's profit been rising, stable or falling in the last 5 years?
151	<p>Debt</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What is the proportion of the farm's own capital ?
770	<p>Farm savings</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Does the farm have adequate savings to cater for its cash needs?
152	<p>Credit limit</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How much more credit can the farm access if needed?</p> <p><i>% of current debt</i></p> <p><i>Estimation</i></p>
153	<p>Problems with loan providers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	In the last 5 years, have there been problems with lenders?

Indicator number	Indicator name (Relevance)	Indicator description
158	<p>Diversification of income</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How many other sources of income (related to agriculture and which contribute more than 10% of farmer's income) exist on the farm besides farming?</p> <p><i>Examples: Services, Agro-tourism, etc.</i></p>

Tab. S38 SMART Indicators for the Sub-Theme “Risk Management”

Indicator number	Indicator name (Relevance)	Indicator description
253	<p>Permanent grasslands: Extensively managed</p> <p>Relevant for farms with the following activities: Arable farming, Permanent grassland, Beef cattle, Pig production, Poultry production, Tropical crops</p>	<p>What proportion of the area of permanent grassland is under extensive management?</p> <p>Extensive means: double mowing/grazing or less, zero application of fertilizers / pesticides</p>
712	<p>Bought-in organic fertilisers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery</p>	<p>What proportion of the entire organic fertilisers used is externally sourced?</p> <p><i>In the past 5 years - average per year?</i></p> <p><i>Green manure not counted in calculation</i></p>
199	<p>Bought-in concentrated feed</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>What proportion of the concentrate feed used on the farm is sourced externally?</p>
720	<p>Silage storage</p> <p>Relevant for farms with the following activities: Permanent grassland, Beef cattle, Pig production, Dairy cattle / Goats / Sheep</p>	<p>Is the silage stored appropriately to minimize losses and avoid contamination?</p>
378	<p>Distance manure heap to waters</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tropical crops</p>	<p>Is the shortest distance between the “worst” of the storage facilities for livestock wastes or silage and the nearest water resource (well, open drain, sewer, river) more than 30m?</p>
721	<p>Storage of feed concentrate</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Is the feed concentrate stored appropriately to minimize losses and avoid contamination?</p>

Indicator number	Indicator name (Relevance)	Indicator description
380	<p>On-farm point sources of nutrients and pollutants</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Can it be excluded that there are direct point source emissions of nutrients and pollutants to the atmosphere and water bodies (incl. wells and drinking water sources) on the farm and its utilized areas? <i>e.g. exports (= emissions through discharge and degas) from exercise yards, farmyard manure stores, livestock water facilities or shelter of animals near to water on pastures, direct entry of animals into the water and cleaning areas.</i></p>
130	<p>Condition of farm infrastructure</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What is the general condition of the farm infrastructure (buildings, installations, machinery and vehicles necessary to maintain proper functioning of the farm)?</p>
186	<p>On-farm renewable energy production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the electricity consumed is generated by the farm's own installations that are run with renewable sources?</p>
288	<p>Arable land: Erosion control > 15 %</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Tropical crops</p>	<p>Are sufficient measures taken on agricultural areas (excluding permanent grassland) with sloping gradients higher than 15 % (up to 30%) to prevent erosion (e.g. contour ploughing)?</p>
299	<p>Arable land: Green cover > 30 %</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Care is taken on agricultural areas with sloping gradients higher than 30 % to ensure a good, continuous green cover (under sown crops, catch crops etc.)?</p>

Indicator number	Indicator name (Relevance)	Indicator description
767	<p>Land ownership</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farmer have secure tenure rights over the land for at least 10 years?
605	<p>Management of riparian strips</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Are the riparian strips extensively managed (minimum width 3m, no cultivation, no fertilizers, no pesticides)?
286	<p>Soil degradation: Measures taken to counter</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>On what proportion of the agricultural area are measures taken to combat relevant soil degradation processes on the farm (e.g. compaction, pollution)?</p> <p><i>Do not consider erosion (already covered in other indicators), see list of examples, award full points if no degradation processes are evident.</i></p>
301	<p>Contamination tests before using bought-in fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>Only in cases, in which external organic fertilizers are applied (e.g. compost, sewage, sludge):</i></p> <p>Are only substances applied (e.g. composts, sewage sludge, wastewater) that have been tested for contamination beforehand (primarily heavy metals, antibiotics) and found to be safe?</p> <p><i>Rate positive if fertilizers from other organic farms are applied.</i></p>
294	<p>Soil analyses for heavy metals</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Have soil analyses been carried out over the past 20 years with a view to assessing heavy metal contamination (of soils or ponds), and, in case of positive tests, were further monitoring analyses undertaken?
606	<p>Landslides and mudslides on agricultural area</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Tropical crops</p>	Were there landslides and/or local mudslides on the farms agricultural area in the past 10 years?

Indicator number	Indicator name (Relevance)	Indicator description
748	<p>Humus Formation: Humus balance</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	<p>1) Is the humus balance calculated?</p> <p>2) Is the humus balance positive, balanced or negative on average? <i>In case of small farms, check whether the farmer focuses on practices that improve humus balance</i></p>
290	<p>Determining fertilizer requirements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When determining fertilizer requirements, are soil analysis results and/or leaf-analysis considered?</p> <p><i>Soil analyses: Once every 5 years: pH, P and K / Annually: N min</i></p>
178	<p>Waiting period between animal manure and harvest</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are the waiting periods between the last application of animal manure and the product harvest adequate?</p> <p><i>Look up the legal provisions before or after the interview.</i></p>
231	<p>No use of synth. chem. herbicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the agricultural area does not receive synthetic chemical herbicide applications?</p>
233	<p>No use of synth. chem. fungicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the agricultural area does not receive synthetic chemical fungicide applications?</p>
234	<p>No use of synth. chem. insecticides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the agricultural area does not receive synthetic chemical insecticide applications?</p> <p><i>Spinosad, Neem and other broad-range organic insecticides count.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
377,1	<p>Pesticides: Number of active substances</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>How many active substances of pesticides are used per year?</p>
257,2	<p>Pesticides: Toxicity aquatic organisms</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered to be toxic to aquatic organisms according to the "PAN Pesticide Database"?</p> <p><i>The strongest impact on organisms of all active ingredients used is assessed</i></p>
257,1	<p>Pesticides: Toxicity bees</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered toxic to bees according to the "PAN Pesticide Database"?</p> <p><i>The strongest impact on bees of all active ingredients used is assessed</i></p>
474,1	<p>Pesticides: Persistence water</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered very persistent in water (half-life > 60 days) according to the "PAN Pesticide Database"?</p>
474,2	<p>Pesticides: Persistence soil</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered to be very persistent in soil (half-life > 180 days) according to the "PAN Pesticide Database"?</p>
474,3	<p>Pesticides: Knowledge about active substances</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are the active substances and the risks associated to their use known to the farm manager?</p>
377,5	<p>Pesticides: Chronic toxicity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered to have adverse long term effects on the users according to the "PAN List of HHPs" or "PAN Pesticide Database"?</p>

Indicator number	Indicator name (Relevance)	Indicator description
377,75	<p>Pesticides: Acute toxicity inhalation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Pesticides: Are active substances used, which are considered acute toxic when inhaled by the users according to the "Globally Harmonized System of Classification (GHS)"?
377,7	<p>Pesticides: Acute toxicity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Pesticides: Are active substances used, which are classified by the WHO as acute toxic to the health of the users?
740	<p>Growth regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farm decline to use synthetic chemical growth regulators ?
747	<p>Flowering regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farm use products to influence the flowering of plants or for desiccation ? <i>Rate positive for nature identical ethylene gas.</i>
405	<p>Water storage capacity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Do sufficient capacities exist for water storage on the farm (retention basins, cisterns)?
619,1	<p>Proportion drained arable land which is not on moorland</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Tropical crops</p>	What is the proportion of drained arable land that is not on moorland (including peatland, wetland)? <i>Comment: Consider all dewatering measures of the past 20 years (e.g. draining, trenching)</i>
618,1	<p>Proportion drained permanent grassland which is not on moorland</p> <p>Relevant for farms with the following activities: Permanent grassland, Tropical crops</p>	What is the proportion of drained grassland that is not on moorland (including peatland, wetland)? <i>Comment: Consider all dewatering measures of the past 20 years (e.g. draining, trenching)</i>

Indicator number	Indicator name (Relevance)	Indicator description
95	<p>Yield loss</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Has the farm been affected by crop failures (> 20% of expected yields) in the past 5 years?
614	<p>Complaints regarding exceeded cell counts</p> <p>Relevant for farms with the following activities: Dairy cattle / Goats / Sheep</p>	Were there any complaints from dairy manufacturers regarding exceeded cell counts in the past 5 years?
245	<p>Locally adapted livestock breeds</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	Are locally adapted livestock breeds kept on the farm?
609	<p>Waiting period for milk deliveries after usage of antibiotics</p> <p>Relevant for farms with the following activities: Dairy cattle / Goats / Sheep</p>	Does the farm always adhere to the waiting period for milk deliveries after using antibiotics or even extend the period?
608	<p>Use of antibiotic drying agents</p> <p>Relevant for farms with the following activities: Dairy cattle / Goats / Sheep</p>	Does the farm use antibiotic drying agents?
723	<p>Buying new animals</p> <p>Relevant for farms with the following activities: Pig production</p>	Does the farm pay attention to written information (data) about the health condition when buying new animals (incl. breed, vaccination, treatments)?
331	<p>Waste disposal: cadaver livestock</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	Are all animal wastes/cadavers disposed properly (not harm human to health and environment)? <i>Score positive if no such wastes arise</i>
188	<p>Share of fuel from own production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Which proportion of the fuel used for farm vehicles and machinery is produced on-farm ?

Indicator number	Indicator name (Relevance)	Indicator description
100	<p>Market challenges</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is the farmer aware and informed about future market challenges?
101	<p>Political / Policy challenges</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is the farmer aware and informed about future policy changes / political challenges?
134	<p>Knowledge of climate change problems</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Does the farm manager know the predictions for climate changes in the region resulting from global climate change and can he judge the impact on the farm?
136	<p>Climate change adaptation measures</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>Only score if there are negative climate-related predictions:</i></p> <p>Is the farm taking steps to adapt to the consequences of climate change?</p>
34,2	<p>Use of chem. synth. seed dressings</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Does the farm refuse to use seeds dressed with synthetic chemicals?

Indicator number	Indicator name (Relevance)	Indicator description
519	<p>Use of GMO-crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Is there a risk that GMO crops are grown at the farm?
34	<p>Use of GMO-feedstuff</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is there a risk that the farm is using GMO feedstuff?
34,1	<p>Use of nanotechnology-based products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is there a risk that nanotechnology products are used on the farm?
8	<p>Verbal commitment to sustainability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If no written commitment exists:</i></p> <p>Is the farm manager committed to the principles of sustainability?</p>
20	<p>Explicit sustainability plan</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Does the farm have a specific (written), publicly available plan defining future improvements to improve its sustainability performance?
750	<p>Oral information sustainability improvements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>In case no written sustainability plan is available:</i></p> <p>Is the farm manager able to describe planned sustainability improvements in detail?</p> <p><i>This includes also improvements on the level of a producer association in case the farm is a member</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
627	<p>Cooperation with other farms</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm successfully, and in the long term, cooperate with other farms?</p> <p><i>Exclude cooperation in marketing (indicator 768).</i></p>
165	<p>Traceability of bought-in farm inputs</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the origin of the externally sourced inputs traceable back to their source?</p> <p><i>Ask separately for the most important farm inputs. This refers to the original source of the inputs, not the point of sale.</i></p>
93	<p>Quality of cooperation with suppliers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of farm inputs comes from contracted suppliers or stable long-term suppliers (estimate)?</p> <p><i>Suppliers: Shops, sales agents etc. Estimate value of inputs purchased from contracted/stable suppliers as a percentage of the total inputs bought in (value terms). Go through all different inputs separately (Seeds, fuel, fertilizer etc.). Ask in clusters 0-20% / 20-40%...)</i></p>
170	<p>Food safety standard</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture, Tropical crops</p>	<p>Does the farm comply with any voluntary standard, on top of legal requirements, covering food safety?</p> <p><i>Examples: GlobalGap, IFS, etc.</i></p>
167	<p>Contaminated products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Have any contaminated products returned to the farm in the last 5 years that posed a risk for food safety?</p>

Indicator number	Indicator name (Relevance)	Indicator description
169	<p>Cases of contamination: Measures</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If contaminated products have left the farm:</i> Have steps been taken to prevent this in future?</p> <p><i>If no contaminated products have left the farm:</i> Are there measures to prevent contaminated products from leaving the farm?</p> <p><i>Do not ask about the following aspects as they are covered by other indicators: antibiotics, cell counts for milk</i></p>
610	<p>Residues of antibiotics in milk</p> <p>Relevant for farms with the following activities: Dairy cattle / Goats / Sheep</p>	Were there complaints from the dairy manufacturers regarding residues of antibiotics in the past 5 years?
83	<p>Diversification of sales</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	To how many customers does the farm sell its products (besides direct sales to private individuals; e.g. wholesalers)?
751	<p>Dependency on main customer</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of sales profit, in terms of income, does the most important buyer generate?</p> <p><i>Direct payments excluded, only revenue from product sales is relevant. Not relevant for 100% direct sales (separate indicator).</i></p>
84	<p>Availability of alternative markets</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Are there alternative markets for all products if buyers drop out?
707	<p>Customer relationship</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture</p>	<p>Does the farm cooperate with customers / buyers?</p> <p>Examples: Common product development, production planning, advisory service from the buyer, etc.</p>

Indicator number	Indicator name (Relevance)	Indicator description
124	<p>Guaranteed staff replacement: Farm succession</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the farm succession secured?</p> <p><i>Do not ask farm managers below 55 years of age.</i></p>
159	<p>Staff turnover</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>In the last 5 years, how many staff changes have there been among the permanent employees of the farm?</p> <p><i>Where > 20% of employees: Ask for reasons.</i></p>
623	<p>Availability of adequate replacement of farm manager</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm manager/farmer have an adequate replacement who is familiar with the farm (e.g. taking care of the animals) in case of illness or holidays?</p>
463,2	<p>Employees: Social protection</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do all employees have social protection (including injury, illness and maternity benefits) and are protected against dismissal?</p> <p><i>Also includes family members who work on the farm.</i></p>
429	<p>Employees: Average working hours</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What are the average working hours per week of all employees (including seasonal workers, family members as well as the farm manager)?</p> <p><i>Expressed in full-time job equivalent.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
437	<p>Employees: Overtime compensation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is overtime compensated at this farm (in terms of time off or overtime pay)?
456,5	<p>Clear ownership rights / social protection for partners in the event of divorce / death</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are the spouse and other dependent relatives of the farm manager provided for in the event of his or her death or in case of divorce (clear ownership rights, etc.)?</p> <p><i>Focus on social security, not on the continuity of farming.</i></p>
464	<p>Systematic identification of potential safety hazards</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>For smallholders and family farms:</i></p> <p>Is the farm manager aware of all relevant potential safety hazards?</p> <p><i>For large operations:</i></p> <p>Are safety hazards systematically identified and recorded?</p>
470	<p>Certification for the use of plant protection and animal treatment products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the farm certified to use plant protection and animal treatment products (e.g., EUREPGAP or similar certification, training by the extension service)?</p> <p><i>In the case that only one expertise is needed and fulfilled: Rate "yes".</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
473	<p>Employees: Training for use of plant protection and animal treatment products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If the operation has no certification:</i></p> <p>Are employees trained in the use and storage of plant protection and animal treatment products?</p> <p><i>In the case that only one expertise is needed and fulfilled: Rate "yes".</i></p>
474	<p>Days of absence due to occupational injuries and work-related illnesses</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How many days (per person per year) of absence due to occupational injuries and work-related illnesses have there been in the past 5 years?</p>
469	<p>Management system for workplace safety and health</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a professional management system for workplace safety and health in place to reduce the risk of injuries and illnesses relating to work?</p>
0	<p>Professional agricultural accounts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have a professional agricultural accounting procedure that is also used for the farm management?</p> <p><i>Rate "partly" if the professional accounts are not used for the farm management.</i></p>
155	<p>Insurance: Fire</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the farm insured against fire damage?</p>

Indicator number	Indicator name (Relevance)	Indicator description
156	<p>Insurance: Natural disasters</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is the farm insured against natural disasters relevant to the region (flooding, landslides, drought etc.)?
151	<p>Debt</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What is the proportion of the farm's own capital ?
770	<p>Farm savings</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Does the farm have adequate savings to cater for its cash needs?
152	<p>Credit limit</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How much more credit can the farm access if needed?</p> <p><i>% of current debt</i></p> <p><i>Estimation</i></p>
158	<p>Diversification of income</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How many other sources of income (related to agriculture and which contribute more than 10% of farmer's income) exist on the farm besides farming?</p> <p><i>Examples: Services, Agro-tourism, etc.</i></p>
768	<p>Collective marketing</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture, Tropical crops</p>	Is the farm involved in collective marketing with other farmers?

Tab. S39 SMART Indicators for the Sub-Theme “Food Safety”

Indicator number	Indicator name (Relevance)	Indicator description
369	<p>Number and quality of drinking points</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep</p>	<p>Are there sufficient numbers of clean, functioning drinking points for all livestock categories? Score negative if distance is >300m (for ruminants)</p>
720	<p>Silage storage</p> <p>Relevant for farms with the following activities: Permanent grassland, Beef cattle, Pig production, Dairy cattle / Goats / Sheep</p>	<p>Is the silage stored appropriately to minimize losses and avoid contamination?</p>
721	<p>Storage of feed concentrate</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Is the feed concentrate stored appropriately to minimize losses and avoid contamination?</p>
511	<p>Contamination through emissions: exhaust emissions, factories or airports</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk of contamination from motorways/heavy traffic roads, industry or airports?</p>
301	<p>Contamination tests before using bought-in fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>Only in cases, in which external organic fertilizers are applied (e.g. compost, sewage, sludge):</i> Are only substances applied (e.g. composts, sewage sludge, wastewater) that have been tested for contamination beforehand (primarily heavy metals, antibiotics) and found to be safe? <i>Rate positive if fertilizers from other organic farms are applied.</i></p>
294	<p>Soil analyses for heavy metals</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Have soil analyses been carried out over the past 20 years with a view to assessing heavy metal contamination (of soils or ponds), and, in case of positive tests, were further monitoring analyses undertaken?</p>

Indicator number	Indicator name (Relevance)	Indicator description
782	<p>Use of clean planting materials</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tropical crops</p>	<p>Are seeds and planting materials obtained from external sources controlled/certified to ensure high levels of seed health, cleanness and germination? If seeds are not officially certified they should be checked in accordance with the rules of the International Seed Testing Association (ISTA).</p>
290	<p>Determining fertilizer requirements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When determining fertilizer requirements, are soil analysis results and/or leaf-analysis considered? <i>Soil analyses: Once every 5 years: pH, P and K / Annually: N min</i></p>
323	<p>Mineral N fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What is the farm's mineral N fertilizer (in kg) usage per hectare per year on its agricultural area?</p>
295	<p>Antibiotics from livestock in fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that manure/slurry from livestock treated with antibiotics is applied to the agricultural area?</p>
178	<p>Waiting period between animal manure and harvest</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are the waiting periods between the last application of animal manure and the product harvest adequate? <i>Look up the legal provisions before or after the interview.</i></p>
708	<p>Precise fertilisation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm use systems for precise fertilisation (e.g. variable rate application methods, drip irrigation with mineral fertilisers)?</p>
710	<p>Harmful substances P-fertilisers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm only use mineral P-fertilisers, which comply with the limits of harmful substances (heavy metals and uranium)?</p>

Indicator number	Indicator name (Relevance)	Indicator description
231	<p>No use of synth. chem. herbicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	What proportion of the agricultural area does not receive synthetic chemical herbicide applications?
233	<p>No use of synth. chem. fungicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	What proportion of the agricultural area does not receive synthetic chemical fungicide applications?
234	<p>No use of synth. chem. insecticides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	What proportion of the agricultural area does not receive synthetic chemical insecticide applications? <i>Spinosad, Neem and other broad-range organic insecticides count.</i>
377,1	<p>Pesticides: Number of active substances</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	How many active substances of pesticides are used per year?
474,1	<p>Pesticides: Persistence water</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Pesticides: Are active substances used, which are considered very persistent in water (half-life > 60 days) according to the "PAN Pesticide Database"?
474,2	<p>Pesticides: Persistence soil</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Pesticides: Are active substances used, which are considered to be very persistent in soil (half-life > 180 days) according to the "PAN Pesticide Database"?

Indicator number	Indicator name (Relevance)	Indicator description
474,3	<p>Pesticides: Knowledge about active substances</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Pesticides: Are the active substances and the risks associated to their use known to the farm manager?
377,5	<p>Pesticides: Chronic toxicity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Pesticides: Are active substances used, which are considered to have adverse long term effects on the users according to the "PAN List of HHPs" or "PAN Pesticide Database"?
377,75	<p>Pesticides: Acute toxicity inhalation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Pesticides: Are active substances used, which are considered acute toxic when inhaled by the users according to the "Globally Harmonized System of Classification (GHS)"?
377,7	<p>Pesticides: Acute toxicity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Pesticides: Are active substances used, which are classified by the WHO as acute toxic to the health of the users?
740	<p>Growth regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farm decline to use synthetic chemical growth regulators ?
747	<p>Flowering regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farm use products to influence the flowering of plants or for desiccation ? <i>Rate positive for nature identical ethylene gas.</i>
376,1	<p>Information on water availability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	In case there is a risk of temporary water scarcity, does the farm have access to information on water availability (e.g. groundwater level)?

Indicator number	Indicator name (Relevance)	Indicator description
376,2	<p>Information on water quality</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Does the farm have access to information on water quality (analysis of water quality)?
377,05	<p>Wastewater: Disposal</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is all wastewater produced on the farm correctly discharged (into sewer for treatment)?
614	<p>Complaints regarding exceeded cell counts</p> <p>Relevant for farms with the following activities: Dairy cattle / Goats / Sheep</p>	Were there any complaints from dairy manufacturers regarding exceeded cell counts in the past 5 years?
609	<p>Waiting period for milk deliveries after usage of antibiotics</p> <p>Relevant for farms with the following activities: Dairy cattle / Goats / Sheep</p>	Does the farm always adhere to the waiting period for milk deliveries after using antibiotics or even extend the period?
608	<p>Use of antibiotic drying agents</p> <p>Relevant for farms with the following activities: Dairy cattle / Goats / Sheep</p>	Does the farm use antibiotic drying agents?
353	<p>Livestock health: Proportion of prophylactic treatments</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	What proportion of the animals (across all livestock categories) was given prophylactic treatments, preventive before any clinical signs of disease, including for purposes of enhanced performance, during the past year?
34,2	<p>Use of chem. synth. seed dressings</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Does the farm refuse to use seeds dressed with synthetic chemicals?

Indicator number	Indicator name (Relevance)	Indicator description
519	Use of GMO-crops Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops	Is there a risk that GMO crops are grown at the farm?
34	Use of GMO-feedstuff Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	Is there a risk that the farm is using GMO feedstuff?
34,1	Use of nanotechnology-based products Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	Is there a risk that nanotechnology products are used on the farm?
776	Harvesting methods Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tropical crops	Are products harvested at the appropriate time and using the best method for optimizing quality and crop health?
777	Storage facilities Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tropical crops	Are storage facilities and equipment kept clean, pest and water leak proof, with good ventilation, stored off-ground, away from the walls and not together with chemicals?
170	Food safety standard Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture, Tropical crops	Does the farm comply with any voluntary standard, on top of legal requirements, covering food safety? <i>Examples: GlobalGap, IFS, etc.</i>
167	Contaminated products Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops	Have any contaminated products returned to the farm in the last 5 years that posed a risk for food safety?

Indicator number	Indicator name (Relevance)	Indicator description
169	<p>Cases of contamination: Measures</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If contaminated products have left the farm:</i> Have steps been taken to prevent this in future?</p> <p><i>If no contaminated products have left the farm:</i> Are there measures to prevent contaminated products from leaving the farm?</p> <p><i>Do not ask about the following aspects as they are covered by other indicators: antibiotics, cell counts for milk</i></p>
610	<p>Residues of antibiotics in milk</p> <p>Relevant for farms with the following activities: Dairy cattle / Goats / Sheep</p>	<p>Were there complaints from the dairy manufacturers regarding residues of antibiotics in the past 5 years?</p>
63	<p>Proportion of environmentally certified products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of sales products is certified to carry an ecolabel?</p> <p><i>All environmental labels are valid that are recommended from WWF (2010):</i> http://assets.wwf.ch/downloads/hintergrundbericht_1_abelratgeber_2010_def_low.pdf.</p>
175	<p>Transparency of production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are details of production methods at the farm transparent and available to buyers?</p> <p><i>E.g. through participation in programmes such as "www.Bio-mit-Gesicht.de" (products are traceable through numbers for the consumer). In the case of direct sales, check the website for information on the production (inputs, practices, labels etc.).</i></p>
470	<p>Certification for the use of plant protection and animal treatment products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the farm certified to use plant protection and animal treatment products (e.g., EUREPGAP or similar certification, training by the extension service)?</p> <p><i>In the case that only one expertise is needed and fulfilled: Rate "yes".</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
473	<p>Employees: Training for use of plant protection and animal treatment products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If the operation has no certification:</i> Are employees trained in the use and storage of plant protection and animal treatment products? <i>In the case that only one expertise is needed and fulfilled: Rate "yes".</i></p>
485	<p>Storage of other hazardous substances</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If other hazardous, besides plant protection and animal treatment products, substances are used:</i> Are they stored safely? <i>No other hazardous substances = yes</i></p>

Tab. S40 SMART Indicators for the Sub-Theme "Food Quality"

Indicator number	Indicator name (Relevance)	Indicator description
368	<p>Stocking density</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	Are stocking densities in the housing system (animals/m ² of floor space) adequate (sufficient space for movements and to avoid animal injuries and stress due to conflicts) for all livestock categories?
722	<p>Injuries of pigs</p> <p>Relevant for farms with the following activities: Pig production</p>	What is the proportion of pigs with abrasions, bite wounds, scuffing marks, scratches, abscesses, injuries and wounds (incl. tails and ears)?
511	<p>Contamination through emissions: exhaust emissions, factories or airports</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is there a risk of contamination from motorways/heavy traffic roads, industry or airports?

Indicator number	Indicator name (Relevance)	Indicator description
244	<p>Number of scattered fruit trees</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How many scattered fruit trees does the farm have (trees per ha agricultural area)?</p>
301	<p>Contamination tests before using bought-in fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>Only in cases, in which external organic fertilizers are applied (e.g. compost, sewage, sludge):</i></p> <p>Are only substances applied (e.g. composts, sewage sludge, wastewater) that have been tested for contamination beforehand (primarily heavy metals, antibiotics) and found to be safe?</p> <p><i>Rate positive if fertilizers from other organic farms are applied.</i></p>
294	<p>Soil analyses for heavy metals</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Have soil analyses been carried out over the past 20 years with a view to assessing heavy metal contamination (of soils or ponds), and, in case of positive tests, were further monitoring analyses undertaken?</p>
223	<p>Rare or endangered agricultural crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>How many rare or endangered agricultural crops are grown on the farm?</p> <p><i>Including crop species and cultivars.</i></p>
320	<p>Crop resistance</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Are cultivars chosen with a view to resistance to harmful organisms and diseases?</p>
290	<p>Determining fertilizer requirements</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When determining fertilizer requirements, are soil analysis results and/or leaf-analysis considered?</p> <p><i>Soil analyses: Once every 5 years: pH, P and K / Annually: N min</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
295	<p>Antibiotics from livestock in fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is there a risk that manure/slurry from livestock treated with antibiotics is applied to the agricultural area?
178	<p>Waiting period between animal manure and harvest</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Are the waiting periods between the last application of animal manure and the product harvest adequate? <i>Look up the legal provisions before or after the interview.</i>
377,5	<p>Pesticides: Chronic toxicity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Pesticides: Are active substances used, which are considered to have adverse long term effects on the users according to the "PAN List of HHPs" or "PAN Pesticide Database"?
614	<p>Complaints regarding exceeded cell counts</p> <p>Relevant for farms with the following activities: Dairy cattle / Goats / Sheep</p>	Were there any complaints from dairy manufacturers regarding exceeded cell counts in the past 5 years?
245	<p>Locally adapted livestock breeds</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	Are locally adapted livestock breeds kept on the farm?
609	<p>Waiting period for milk deliveries after usage of antibiotics</p> <p>Relevant for farms with the following activities: Dairy cattle / Goats / Sheep</p>	Does the farm always adhere to the waiting period for milk deliveries after using antibiotics or even extend the period?
608	<p>Use of antibiotic drying agents</p> <p>Relevant for farms with the following activities: Dairy cattle / Goats / Sheep</p>	Does the farm use antibiotic drying agents?
352	<p>Livestock health: Proportion of curative treatments</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	What proportion of the animals (across all livestock categories) received curative antibiotics treatments (for actual illnesses) during the last year?

Indicator number	Indicator name (Relevance)	Indicator description
358	Cattle: Losses Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	How high was the loss of cows/beef in the past year?
358,1	Poultry: Losses Relevant for farms with the following activities: Poultry production	How high was average monthly loss of poultry in the past year? <i>Score based on poultry category with highest loss rate</i>
353	Livestock health: Proportion of prophylactic treatments Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture	What proportion of the animals (across all livestock categories) was given prophylactic treatments, preventive before any clinical signs of disease, including for purposes of enhanced performance, during the past year?
613	Livestock health: Hormonal treatment for problems with livestock in heat Relevant for farms with the following activities: Beef cattle, Pig production, Dairy cattle / Goats / Sheep	Does the farm use hormonal treatments for livestock with in-heat problems?
723	Buying new animals Relevant for farms with the following activities: Pig production	Does the farm pay attention to written information (data) about the health condition when buying new animals (incl. breed, vaccination, treatments)?
227	Alpine pasturage and shepherding Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	What proportion of the livestock is moved to alpine pasture in the summer? <i>Do not answer question if in a region with no alpine pasture.</i>
370,5	Daily outdoor access for animals Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep	Do all animals have daily outdoor access (year-round)? <i>Score based on worst animal category</i> <i>For poultry: possibility for outdoor access is sufficient</i>
371	Access to pasture: Months per year Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep	How many days per year are the ruminants out on pasture? Ask for summer and winter separately
375	Animal welfare standards slaughter Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture	Does the farm manager know the welfare standards of the slaughterhouse? <i>Score based on worst animal category. If farmer is not familiar with the welfare standards, rate as negative</i>

Indicator number	Indicator name (Relevance)	Indicator description
519	<p>Use of GMO-crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Is there a risk that GMO crops are grown at the farm?
776	<p>Harvesting methods</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tropical crops</p>	Are products harvested at the appropriate time and using the best method for optimizing quality and crop health?
777	<p>Storage facilities</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tropical crops</p>	Are storage facilities and equipment kept clean, pest and water leak proof, with good ventilation, stored off-ground, away from the walls and not together with chemicals?
146	<p>Product returns</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	In the past 5 years, have any products been returned or rejected by buyers due to poor quality?
170	<p>Food safety standard</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture, Tropical crops</p>	Does the farm comply with any voluntary standard, on top of legal requirements, covering food safety? <i>Examples: GlobalGap, IFS, etc.</i>
610	<p>Residues of antibiotics in milk</p> <p>Relevant for farms with the following activities: Dairy cattle / Goats / Sheep</p>	Were there complaints from the dairy manufacturers regarding residues of antibiotics in the past 5 years?
63	<p>Proportion of environmentally certified products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of sales products is certified to carry an ecolabel?</p> <p><i>All environmental labels are valid that are recommended from WWF (2010):</i> <i>http://assets.wwf.ch/downloads/hintergrundbericht_1_abelratgeber_2010_def_low.pdf</i></p>

Tab. S41 SMART Indicators for the Sub-Theme “Product Information”

Indicator number	Indicator name (Relevance)	Indicator description
474,3	<p>Pesticides: Knowledge about active substances</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are the active substances and the risks associated to their use known to the farm manager?</p>
165	<p>Traceability of bought-in farm inputs</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the origin of the externally sourced inputs traceable back to their source? <i>Ask separately for the most important farm inputs. This refers to the original source of the inputs, not the point of sale.</i></p>
4	<p>Environmental responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they have an environmental certificate? <i>Inputs to consider: Feedstuffs, Mineral fertilisers, organic fertilisers (if bought in). Assess based on the labels (e.g. organic label).</i></p>
5	<p>Social responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they meet social standards / certificates? <i>Inputs to consider: Feedstuffs, Mineral fertilisers, Organic fertilisers (if bought in) Assess based on the labels. Possible certifications/labels: Round Table on Responsible Soy (RTRS) and Pro Terra.</i></p>
162	<p>Procurement < 50 km</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>What proportion of externally sourced feed comes from within 50 km of the farm? <i>In cases in which the origin of feed is unknown add it to ID164 (Procurement > 500 km). This refers to the original source of the inputs, not the point of sale.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
164	<p>Procurement > 500 km</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>What proportion of externally sourced feed comes from more than 500 km from the farm?</p> <p><i>All feed with unknown origin is added to this indicator. This refers to the original source of the inputs, not the point of sale.</i></p>
514	<p>Farm inputs from countries with problematic social conditions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that farm inputs originate from countries with problematic social conditions and don't have a social certification?</p> <p><i>(Problematic regions according to ILO: Middle East, Africa, Latin America, Caribbean, Asia and the Pacific; for individual countries refer to BSCI-rating). If no, can information regarding the social compatibility of their production be furnished? (This relates to where the farm inputs originally came from.)</i></p>
149	<p>Length of customer relationships</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>On average, for how many years has the farm been selling its products to the present customers?</p> <p><i>1) Rank the most important buyers according to their share on farmer's income (take direct sales as one buyer).</i></p> <p><i>2) For the most important buyers, which account for at least 60% of the farmer's income, ask for the number of years.</i></p> <p><i>3) Calculate the weighted average according to the buyer's share on farmer's income.</i></p>
63	<p>Proportion of environmentally certified products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of sales products is certified to carry an ecolabel?</p> <p><i>All environmental labels are valid that are recommended from WWF (2010):</i></p> <p><i>http://assets.wwf.ch/downloads/hintergrundbericht_abelratgeber_2010_def_low.pdf.</i></p>
65	<p>Proportion of products meeting social standards</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of sold products is certified to carry a social label? All social labels are valid that are recommended from WWF (2010):</p> <p><i>http://assets.wwf.ch/downloads/hintergrundbericht_labelratgeber_2010_def_low.pdf.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
141	<p>Direct sales</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are there direct (on-the-farm, farmer's market) sales?</p> <p>If yes: What proportion of the farm's income comes from direct sales?</p> <p><i>If necessary estimated.</i></p>
175	<p>Transparency of production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are details of production methods at the farm transparent and available to buyers?</p> <p><i>E.g. through participation in programmes such as "www.Bio-mit-Gesicht.de" (products are traceable through numbers for the consumer). In the case of direct sales, check the website for information on the production (inputs, practices, labels etc.).</i></p>

Tab. S42 SMART Indicators for the Sub-Theme "Value Creation"

Indicator number	Indicator name (Relevance)	Indicator description
145	<p>On farm processing</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the sales comes from processed products?</p> <p><i>If necessary estimated.</i></p>
181	<p>Full-time jobs per hectare</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How many full-time jobs does the farm support per hectare of agricultural area?</p> <p><i>See total full-time jobs-figure in farm information table "Q_GeneralInformation" and calculate number.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
512	<p>Number of jobs created/removed</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How many new (= additional) jobs have been created at your farm in the past 5 years, or how many jobs have been removed?</p>
463,1	<p>Employees: Permanent workforce</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the workforce is permanently employed?</p> <p><i>Permanently: Open-ended contract.</i></p>
463,2	<p>Employees: Social protection</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do all employees have social protection (including injury, illness and maternity benefits) and are protected against dismissal?</p> <p><i>Also includes family members who work on the farm.</i></p>
118	<p>Employees: Work permits</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture</p>	<p>Do all employees have work permits and are they registered with the authorities?</p>
429	<p>Employees: Average working hours</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What are the average working hours per week of all employees (including seasonal workers, family members as well as the farm manager)?</p> <p><i>Expressed in full-time job equivalent.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
410	<p>Relationship paid salary to regional, sector-specific minimum salary</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How does the minimum wage that the operation pays to its employees compares with the statutory minimum wage that is generally paid in this region and sector?</p> <p><i>Except apprentices.</i></p>
119	<p>Apprenticeships</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are apprenticeships and/or traineeships regularly offered on the farm?</p> <p><i>Ratio of numbers of apprenticeships and other training opportunities to full time equivalent employees.</i></p>
752	<p>Education and training at master level (master crafts men places)</p> <p>Relevant for farms with the following activities: Pot plants / Plant nursery</p>	<p>Is education and training at master level (master crafts men places) regularly offered?</p> <p><i>Quotient of numbers of master trainings to full time equivalent employees.</i></p>
768	<p>Collective marketing</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture, Tropical crops</p>	<p>Is the farm involved in collective marketing with other farmers?</p>

Tab. S43 SMART Indicators for the Sub-Theme “Local Procurement”

Indicator number	Indicator name (Relevance)	Indicator description
298	<p>Soil improvement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of formerly degraded lands (not suitable for farming) has been regenerated over the past 20 years and can again be used for farming?</p> <p><i>Measures include e.g. compost applications, liming, fertilizer applications</i></p> <p><i>Full score for completely fertile soils</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
162	<p>Procurement < 50 km</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>What proportion of externally sourced feed comes from within 50 km of the farm?</p> <p><i>In cases in which the origin of feed is unknown add it to ID164 (Procurement > 500 km).</i></p> <p><i>This refers to the original source of the inputs, not the point of sale.</i></p>
164	<p>Procurement > 500 km</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>What proportion of externally sourced feed comes from more than 500 km from the farm?</p> <p><i>All feed with unknown origin is added to this indicator.</i></p> <p><i>This refers to the original source of the inputs, not the point of sale.</i></p>

Tab. S44 SMART Indicators for the Sub-Theme “Quality of Life”

Indicator number	Indicator name (Relevance)	Indicator description
789	<p>On farm mechanization grade</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>To what extent is the physical workload on the farm reduced due to the degree of mechanization?</p>
628	<p>Mechanization: Milking</p> <p>Relevant for farms with the following activities: Dairy cattle / Goats / Sheep</p>	<p>To what extent does mechanization reduce the physical workload when milking?</p>
629	<p>Mechanization: Feeding roughage</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Dairy cattle / Goats / Sheep</p>	<p>To what extent does mechanization reduce the physical workload when feeding roughage?</p>
630	<p>Mechanization: Feeding concentrated fodder</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>To what extent does mechanization reduce the physical workload when giving concentrate fodder?</p>

Indicator number	Indicator name (Relevance)	Indicator description
631	<p>Mechanization: Mucking out Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep</p>	To what extent does mechanization reduce the physical workload when mucking out?
491	<p>Availability of regular meals, beverages and toilet facilities Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Are all employees (temporary and regular) able to have regular meals, drink sufficiently and use toilet facilities?
517	<p>Feed No Food: grazing livestock Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep</p>	What proportion of the feed given to grazing livestock would be suitable for human consumption (For maize silage take standard yields for grain maize)?
518	<p>Feed No Food: non-grazing animals Relevant for farms with the following activities: Pig production, Poultry production, Aquaculture</p>	What proportion of the feed given to non-grazing animals would be suitable for human consumption? <i>Contrary to e.g. waste products</i> <i>Score based on worst animal category</i>
22	<p>Successful conflict resolution (social/environmental) Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<i>If the farm has been involved in incidents with negative environmental / social impacts:</i> Did they result in conflicts with stakeholders (employees, residents or environmental groups etc.) that have not been resolved ?
67	<p>Prevention of resource conflicts Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Does the farm have mechanisms for preventing the use of resources that have been, or are, legally disputed, or whose ownership is unclear (water, land, biodiversity, etc.)? <i>E.g. use a movable fence to avoid grazing conflicts or involvement of concerned stakeholders to commonly set basic rules for the use of water.</i>

Indicator number	Indicator name (Relevance)	Indicator description
5	<p>Social responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they meet social standards / certificates?</p> <p><i>Inputs to consider: Feedstuffs, Mineral fertilisers, Organic fertilisers (if bought in)</i></p> <p><i>Assess based on the labels.</i></p> <p><i>Possible certifications/labels: Round Table on Responsible Soy (RTRS) and Pro Terra.</i></p>
514	<p>Farm inputs from countries with problematic social conditions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that farm inputs originate from countries with problematic social conditions and don't have a social certification?</p> <p><i>(Problematic regions according to ILO: Middle East, Africa, Latin America, Caribbean, Asia and the Pacific; for individual countries refer to BSCI-rating).</i></p> <p><i>If no, can information regarding the social compatibility of their production be furnished? (This relates to where the farm inputs originally came from.)</i></p>
439	<p>Forced labour at suppliers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that suppliers of the farm (other operations within the farm's sphere of influence) were involved in any incidences of forced labour in the past 10 years? <i>Problematic regions according to ILO [> 3%]: Non-EU-countries in Eastern Europe, Middle-East, Africa, Latin America, Caribbean and Pacific.</i></p>
753	<p>Child labour at suppliers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that suppliers to the farm (other operations within the farm's sphere of influence) have been involved in any incidences of child labour abuse over the past 10 years?</p> <p><i>Problematic regions according to ILO [> 5%]: Middle-East, Africa, Latin America, Asia and Pacific.</i></p>
512	<p>Number of jobs created/removed</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How many new (= additional) jobs have been created at your farm in the past 5 years, or how many jobs have been removed?</p>

Indicator number	Indicator name (Relevance)	Indicator description
159	<p>Staff turnover</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>In the last 5 years, how many staff changes have there been among the permanent employees of the farm? <i>Where > 20% of employees: Ask for reasons.</i></p>
623	<p>Availability of adequate replacement of farm manager</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm manager/farmer have an adequate replacement who is familiar with the farm (e.g. taking care of the animals) in case of illness or holidays?</p>
118	<p>Employees: Work permits</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture</p>	<p>Do all employees have work permits and are they registered with the authorities?</p>
442	<p>Employees: Freedom of assembly and collective bargaining rights</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are employees free to assemble and engage in (collective) bargaining?</p>
442,1	<p>Employees: Freedom of joining unions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are employees free to join unions?</p>

Indicator number	Indicator name (Relevance)	Indicator description
429	<p>Employees: Average working hours</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What are the average working hours per week of all employees (including seasonal workers, family members as well as the farm manager)?</p> <p><i>Expressed in full-time job equivalent.</i></p>
437	<p>Employees: Overtime compensation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is overtime compensated at this farm (in terms of time off or overtime pay)?</p>
622	<p>Work-Life-Balance family workers (holiday)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>To what degree does the farm manager (and family workers) take holidays?</p>
490	<p>Employees: Regular breaks</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are all employees free to take regular breaks?</p> <p><i>Regular breaks:</i></p> <ul style="list-style-type: none"> - Long break of one hour per working day (9h) - Additional breaks (at least 0.25 h) for each half day <p><i>Example for 1 working day: 1 hour-break and 2 smaller breaks of 0.25 h.</i></p>
445	<p>Employees: Incidences of harassment and mobbing</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Have there been any incidences of employees being harassed or mobbed in the past 5 years?</p>

Indicator number	Indicator name (Relevance)	Indicator description
456,5	<p>Clear ownership rights / social protection for partners in the event of divorce / death</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are the spouse and other dependent relatives of the farm manager provided for in the event of his or her death or in case of divorce (clear ownership rights, etc.)?</p> <p><i>Focus on social security, not on the continuity of farming.</i></p>
410	<p>Relationship paid salary to regional, sector-specific minimum salary</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How does the minimum wage that the operation pays to its employees compares with the statutory minimum wage that is generally paid in this region and sector?</p> <p><i>Except apprentices.</i></p>
438	<p>Forced labour at the farm</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that the farm was involved in any incidences of forced labour in the past 10 years?</p>
483	<p>Access to medical care</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do all employees (temporary and regular) have access to medical care?</p> <p><i>Include family workers and the farm manager. Both public and private health care are acceptable.</i></p> <p><i>Example: The farm provides a car to drive to a near-by hospital in case of emergency and provides coverage for treatment costs.</i></p>
492	<p>Employees: Nutritional meals</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm offer its employee's regular, nutritious meals and/or is there a kitchen where employees can prepare meals?</p>

Indicator number	Indicator name (Relevance)	Indicator description
791	<p>Household food security</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do all members of the farm household have adequate nutritional meals each day?</p>
440	<p>Child labour: Impairment of school performance</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If children (< 16 years old) who live on or off the farm work at the farm:</i></p> <p>Is there a risk that the children's school performance is hampered by that work (e.g., they are tired at school or do not have time to complete homework assignments)?</p> <p><i>If no children help, do not assess.</i></p>
441	<p>Child labour: Hazardous forms of work</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If children (< 16 years old) help with the work:</i></p> <p>Is there a risk that this work may be hazardous to their health or development (e.g., carrying heavy loads or doing dangerous work, applying plant protection products)?</p> <p><i>If no children help, do not assess.</i></p>
455	<p>Anti-discrimination measures</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm take measures to prevent discrimination against women, minorities and vulnerable groups?</p> <p><i>Example: Contracts for all employees are based on a clear defined set of rules.</i></p>
460	<p>Proactive support of disadvantaged groups</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does this operation provide extra support to disadvantaged groups (women, minorities, disabled people, etc.)?</p> <p><i>Give specific examples: Financially support to women during their maternity leave, paying for the language courses of non-native speakers etc.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
454	<p>Commitment against discrimination</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>Only for large farms:</i></p> <p>Has the farm committed itself with a written document to prevent discrimination against women, minorities and vulnerable groups?</p>
456	<p>Equal pay</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do women, men, people with disabilities, minorities and vulnerable groups receive equal pay for equal work/output at this farm?</p> <p><i>If family workers voluntarily receive unequal pay, give a positive assessment</i></p>
458	<p>Disabled employees/inhabitants</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are there disabled people who work and/or live at this farm?</p>
464	<p>Systematic identification of potential safety hazards</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>For smallholders and family farms:</i></p> <p>Is the farm manager aware of all relevant potential safety hazards?</p> <p><i>For large operations:</i></p> <p>Are safety hazards systematically identified and recorded?</p>
790	<p>Employees: Use of protective gear</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Bees, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farmer ensure that workers have appropriate protection during their application of pesticides and other hazardous materials?</p>

Indicator number	Indicator name (Relevance)	Indicator description
474	<p>Days of absence due to occupational injuries and work-related illnesses</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How many days (per person per year) of absence due to occupational injuries and work-related illnesses have there been in the past 5 years?</p>
469	<p>Management system for workplace safety and health</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a professional management system for workplace safety and health in place to reduce the risk of injuries and illnesses relating to work?</p>
74	<p>Environmental involvement outside the farm: Costs</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the farm involved in environmental protection (not paid for), besides its own land? If yes, how many days per year are taken for such projects?</p>
75	<p>Social involvement outside the farm: Costs</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the farm involved in social matters (not paid for) in the community? If yes, how many days on average per year are taken for this commitment?</p>
506	<p>Food security measures for local communities</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Aquaculture, Tropical crops</p>	<p>Does the farm take steps / implement projects to enhance the food security of the local community, or does it financially support such efforts?</p> <p><i>Examples: Teach other farmers how to store or to further process raw products.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
515	<p>Subsistence farming</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture, Tropical crops</p>	To what extent does the farm supply its own food needs and those of its employees, as far as the local environmental conditions allow?
99	<p>Profit stability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Has the farm's profit been rising, stable or falling in the last 5 years?

Tab. S45 SMART Indicators for the Sub-Theme "Capacity Development"

Indicator number	Indicator name (Relevance)	Indicator description
473	<p>Employees: Training for use of plant protection and animal treatment products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If the operation has no certification:</i></p> <p>Are employees trained in the use and storage of plant protection and animal treatment products?</p> <p><i>In the case that only one expertise is needed and fulfilled: Rate "yes".</i></p>
72	<p>Further training for farm staff</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How many days of further education or training (per person) were taken during the last year (including farm manager and employees)?</p> <p><i>Further training: External person on the farm or participation in external, thematic events (excluding trade shows!).</i></p> <p><i>Total number of days spent for further training during last year on average per person.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
125	<p>Training on sustainability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If participated in training:</i></p> <p>Have competences/knowledge relating to environmental, social and economic sustainability also been taught?</p>
412	<p>Employees: Access to external training</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the employees had access to external training in the past 5 years (at least 1 training course)? How does the farm financially support this?</p> <p><i>Account for all employees, for which an external training was financed.</i></p>
119	<p>Apprenticeships</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are apprenticeships and/or traineeships regularly offered on the farm?</p> <p><i>Ratio of numbers of apprenticeships and other training opportunities to full time equivalent employees.</i></p>
752	<p>Education and training at master level (master crafts men places)</p> <p>Relevant for farms with the following activities: Pot plants / Plant nursery</p>	<p>Is education and training at master level (master crafts men places) regularly offered?</p> <p><i>Quotient of numbers of master trainings to full time equivalent employees.</i></p>
703	<p>Access to advisory services</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have adequate access to advisory services?</p>

Tab. S46

SMART Indicators for the Sub-Theme “Fair Access to Means of Production”

Indicator number	Indicator name (Relevance)	Indicator description
767	<p>Land ownership</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farmer have secure tenure rights over the land for at least 10 years?
22	<p>Successful conflict resolution (social/environmental)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If the farm has been involved in incidents with negative environmental / social impacts:</i></p> <p>Did they result in conflicts with stakeholders (employees, residents or environmental groups etc.) that have not been resolved?</p>
403	<p>Conflicts over water quantity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Are there, or have there been, any conflicts with other water users / stakeholders in the farm's neighbourhood over access to water and the volume of water used ?
402	<p>Conflicts over water quality</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Are there, or have there been, any conflicts with other water users / stakeholders over water quality in the farm's neighbourhood?
67	<p>Prevention of resource conflicts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have mechanisms for preventing the use of resources that have been, or are, legally disputed, or whose ownership is unclear (water, land, biodiversity, etc.)?</p> <p><i>E.g. use a movable fence to avoid grazing conflicts or involvement of concerned stakeholders to commonly set basic rules for the use of water.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
514	<p>Farm inputs from countries with problematic social conditions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that farm inputs originate from countries with problematic social conditions and don't have a social certification?</p> <p><i>(Problematic regions according to ILO: Middle East, Africa, Latin America, Caribbean, Asia and the Pacific; for individual countries refer to BSCI-rating).</i></p> <p><i>If no, can information regarding the social compatibility of their production be furnished? (This relates to where the farm inputs originally came from.)</i></p>
72	<p>Further training for farm staff</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How many days of further education or training (per person) were taken during the last year (including farm manager and employees)?</p> <p><i>Further training: External person on the farm or participation in external, thematic events (excluding trade shows!).</i></p> <p><i>Total number of days spent for further training during last year on average per person.</i></p>
412	<p>Employees: Access to external training</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the employees had access to external training in the past 5 years (at least 1 training course)? How does the farm financially support this?</p> <p><i>Account for all employees, for which an external training was financed.</i></p>
703	<p>Access to advisory services</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have adequate access to advisory services?</p>
513	<p>Dispossession of smallholders / local communities</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that smallholders or local communities were dispossessed (without adequate compensation) in order to establish this farm?</p>

Tab. S47 SMART Indicators for the Sub-Theme “Responsible Buyers”

Indicator number	Indicator name (Relevance)	Indicator description
22	<p>Successful conflict resolution (social/environmental) Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If the farm has been involved in incidents with negative environmental / social impacts:</i> Did they result in conflicts with stakeholders (employees, residents or environmental groups etc.) that have not been resolved?</p>
627	<p>Cooperation with other farms Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm successfully, and in the long term, cooperate with other farms? <i>Exclude cooperation in marketing (indicator 768).</i></p>
67	<p>Prevention of resource conflicts Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have mechanisms for preventing the use of resources that have been, or are, legally disputed, or whose ownership is unclear (water, land, biodiversity, etc.)? <i>E.g. use a movable fence to avoid grazing conflicts or involvement of concerned stakeholders to commonly set basic rules for the use of water.</i></p>
5	<p>Social responsibility in procurement Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they meet social standards / certificates? <i>Inputs to consider: Feedstuffs, Mineral fertilisers, Organic fertilisers (if bought in)</i> <i>Assess based on the labels.</i> <i>Possible certifications/labels: Round Table on Responsible Soy (RTRS) and Pro Terra.</i></p>
93	<p>Quality of cooperation with suppliers Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of farm inputs comes from contracted suppliers or stable long-term suppliers (estimate)? <i>Suppliers: Shops, sales agents etc. Estimate value of inputs purchased from contracted/stable suppliers as a percentage of the total inputs bought in (value terms). Go through all different inputs separately (Seeds, fuel, fertilizer etc.). Ask in clusters 0-20% / 20-40%...)</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
514	<p>Farm inputs from countries with problematic social conditions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that farm inputs originate from countries with problematic social conditions and don't have a social certification?</p> <p><i>(Problematic regions according to ILO: Middle East, Africa, Latin America, Caribbean, Asia and the Pacific; for individual countries refer to BSCI-rating).</i></p> <p><i>If no, can information regarding the social compatibility of their production be furnished? (This relates to where the farm inputs originally came from.)</i></p>
439	<p>Forced labour at suppliers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that suppliers of the farm (other operations within the farm's sphere of influence) were involved in any incidences of forced labour in the past 10 years? <i>Problematic regions according to ILO [> 3%]: Non-EU-countries in Eastern Europe, Middle-East, Africa, Latin America, Caribbean and Pacific.</i></p>
753	<p>Child labour at suppliers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that suppliers to the farm (other operations within the farm's sphere of influence) have been involved in any incidences of child labour abuse over the past 10 years?</p> <p><i>Problematic regions according to ILO [> 5%]: Middle-East, Africa, Latin America, Asia and Pacific.</i></p>
505	<p>Recognition / payment for traditional or indigenous knowledge</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that the farm uses methods / resources (in particular if they are based on patents), which originate from traditional knowledge of people / population groups that have not been compensated for the commercial use of this traditional knowledge?</p> <p><i>Example: As a precautionary principle, the farmer does not use patented seeds.</i></p>
768	<p>Collective marketing</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture, Tropical crops</p>	<p>Is the farm involved in collective marketing with other farmers?</p>

Tab. S48 SMART Indicators for the Sub-Theme “Rights of Suppliers”

Indicator number	Indicator name (Relevance)	Indicator description
22	<p>Successful conflict resolution (social/environmental)</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If the farm has been involved in incidents with negative environmental / social impacts:</i></p> <p>Did they result in conflicts with stakeholders (employees, residents or environmental groups etc.) that have not been resolved?</p>
5	<p>Social responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they meet social standards / certificates?</p> <p><i>Inputs to consider: Feedstuffs, Mineral fertilisers, Organic fertilisers (if bought in)</i></p> <p><i>Assess based on the labels.</i></p> <p><i>Possible certifications/labels: Round Table on Responsible Soy (RTRS) and Pro Terra.</i></p>
93	<p>Quality of cooperation with suppliers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of farm inputs comes from contracted suppliers or stable long-term suppliers (estimate)?</p> <p><i>Suppliers: Shops, sales agents etc. Estimate value of inputs purchased from contracted/stable suppliers as a percentage of the total inputs bought in (value terms). Go through all different inputs separately (Seeds, fuel, fertilizer etc.). Ask in clusters 0-20% / 20-40%...)</i></p>
514	<p>Farm inputs from countries with problematic social conditions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that farm inputs originate from countries with problematic social conditions and don't have a social certification?</p> <p><i>(Problematic regions according to ILO: Middle East, Africa, Latin America, Caribbean, Asia and the Pacific; for individual countries refer to BSCI-rating).</i></p> <p><i>If no, can information regarding the social compatibility of their production be furnished? (This relates to where the farm inputs originally came from.)</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
439	<p>Forced labour at suppliers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that suppliers of the farm (other operations within the farm's sphere of influence) were involved in any incidences of forced labour in the past 10 years? <i>Problematic regions according to ILO [> 3%]: Non-EU-countries in Eastern Europe, Middle-East, Africa, Latin America, Caribbean and Pacific.</i></p>

Tab. S49 SMART Indicators for the Sub-Theme "Employment Relations"

Indicator number	Indicator name (Relevance)	Indicator description
5	<p>Social responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they meet social standards / certificates? <i>Inputs to consider: Feedstuffs, Mineral fertilisers, Organic fertilisers (if bought in)</i> <i>Assess based on the labels.</i> <i>Possible certifications/labels: Round Table on Responsible Soy (RTRS) and Pro Terra.</i></p>
514	<p>Farm inputs from countries with problematic social conditions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that farm inputs originate from countries with problematic social conditions and don't have a social certification? <i>(Problematic regions according to ILO: Middle East, Africa, Latin America, Caribbean, Asia and the Pacific; for individual countries refer to BSCI-rating).</i> <i>If no, can information regarding the social compatibility of their production be furnished? (This relates to where the farm inputs originally came from.)</i></p>
753	<p>Child labour at suppliers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that suppliers to the farm (other operations within the farm's sphere of influence) have been involved in any incidences of child labour abuse over the past 10 years? <i>Problematic regions according to ILO [> 5%]: Middle-East, Africa, Latin America, Asia and Pacific.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
97	<p>Staff shortages</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Have there been staff shortages in the last five years that could not be resolved?</p> <p><i>Examples: Due to additional staff requirements during peak periods, replacement of senior staff members etc.</i></p>
512	<p>Number of jobs created/removed</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How many new (= additional) jobs have been created at your farm in the past 5 years, or how many jobs have been removed?</p>
159	<p>Staff turnover</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>In the last 5 years, how many staff changes have there been among the permanent employees of the farm?</p> <p><i>Where > 20% of employees: Ask for reasons.</i></p>
423	<p>Employees: Legally binding contracts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do all of the employees have legally binding employment contracts?</p>
463,1	<p>Employees: Permanent workforce</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the workforce is permanently employed?</p> <p><i>Permanently: Open-ended contract.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
463,2	<p>Employees: Social protection</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do all employees have social protection (including injury, illness and maternity benefits) and are protected against dismissal? <i>Also includes family members who work on the farm.</i></p>
118	<p>Employees: Work permits</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture</p>	<p>Do all employees have work permits and are they registered with the authorities?</p>
442	<p>Employees: Freedom of assembly and collective bargaining rights</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are employees free to assemble and engage in (collective) bargaining?</p>
442,1	<p>Employees: Freedom of joining unions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are employees free to join unions?</p>
429	<p>Employees: Average working hours</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What are the average working hours per week of all employees (including seasonal workers, family members as well as the farm manager)? <i>Expressed in full-time job equivalent.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
437	<p>Employees: Overtime compensation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is overtime compensated at this farm (in terms of time off or overtime pay)?
490	<p>Employees: Regular breaks</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are all employees free to take regular breaks?</p> <p><i>Regular breaks:</i></p> <ul style="list-style-type: none"> - Long break of one hour per working day (9h) - Additional breaks (at least 0.25 h) for each half day <p><i>Example for 1 working day: 1 hour-break and 2 smaller breaks of 0.25 h.</i></p>
456,5	<p>Clear ownership rights / social protection for partners in the event of divorce / death</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are the spouse and other dependent relatives of the farm manager provided for in the event of his or her death or in case of divorce (clear ownership rights, etc.)?</p> <p><i>Focus on social security, not on the continuity of farming.</i></p>
410	<p>Relationship paid salary to regional, sector-specific minimum salary</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How does the minimum wage that the operation pays to its employees compares with the statutory minimum wage that is generally paid in this region and sector?</p> <p><i>Except apprentices.</i></p>
438	<p>Forced labour at the farm</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is there a risk that the farm was involved in any incidences of forced labour in the past 10 years?

Indicator number	Indicator name (Relevance)	Indicator description
440	<p>Child labour: Impairment of school performance</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If children (< 16 years old) who live on or off the farm work at the farm:</i></p> <p>Is there a risk that the children’s school performance is hampered by that work (e.g., they are tired at school or do not have time to complete homework assignments)?</p> <p><i>If no children help, do not assess.</i></p>
441	<p>Child labour: Hazardous forms of work</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If children (< 16 years old) help with the work:</i></p> <p>Is there a risk that this work may be hazardous to their health or development (e.g., carrying heavy loads or doing dangerous work, applying plant protection products)?</p> <p><i>If no children help, do not assess.</i></p>
119	<p>Apprenticeships</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are apprenticeships and/or traineeships regularly offered on the farm?</p> <p><i>Ratio of numbers of apprenticeships and other training opportunities to full time equivalent employees.</i></p>
752	<p>Education and training at master level (master crafts men places)</p> <p>Relevant for farms with the following activities: Pot plants / Plant nursery</p>	<p>Is education and training at master level (master crafts men places) regularly offered?</p> <p><i>Quotient of numbers of master trainings to full time equivalent employees.</i></p>

Tab. S50 SMART Indicators for the Sub-Theme “Forced Labour”

Indicator number	Indicator name (Relevance)	Indicator description
5	<p>Social responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they meet social standards / certificates?</p> <p><i>Inputs to consider: Feedstuffs, Mineral fertilisers, Organic fertilisers (if bought in)</i></p> <p><i>Assess based on the labels.</i></p> <p><i>Possible certifications/labels: Round Table on Responsible Soy (RTRS) and Pro Terra.</i></p>
514	<p>Farm inputs from countries with problematic social conditions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that farm inputs originate from countries with problematic social conditions and don't have a social certification?</p> <p><i>(Problematic regions according to ILO: Middle East, Africa, Latin America, Caribbean, Asia and the Pacific; for individual countries refer to BSCI-rating).</i></p> <p><i>If no, can information regarding the social compatibility of their production be furnished? (This relates to where the farm inputs originally came from.)</i></p>
439	<p>Forced labour at suppliers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that suppliers of the farm (other operations within the farm's sphere of influence) were involved in any incidences of forced labour in the past 10 years? <i>Problematic regions according to ILO [> 3%]: Non-EU-countries in Eastern Europe, Middle-East, Africa, Latin America, Caribbean and Pacific.</i></p>
65	<p>Proportion of products meeting social standards</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of sold products is certified to carry a social label? All social labels are valid that are recommended from WWF (2010):</p> <p>http://assets.wwf.ch/downloads/hintergrundbericht_labelratgeber_2010_def_low.pdf.</p>
423	<p>Employees: Legally binding contracts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do all of the employees have legally binding employment contracts?</p>

Indicator number	Indicator name (Relevance)	Indicator description
463,2	<p>Employees: Social protection</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do all employees have social protection (including injury, illness and maternity benefits) and are protected against dismissal?</p> <p><i>Also includes family members who work on the farm.</i></p>
118	<p>Employees: Work permits</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture</p>	<p>Do all employees have work permits and are they registered with the authorities?</p>
442	<p>Employees: Freedom of assembly and collective bargaining rights</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are employees free to assemble and engage in (collective) bargaining?</p>
442,1	<p>Employees: Freedom of joining unions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are employees free to join unions?</p>
438	<p>Forced labour at the farm</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that the farm was involved in any incidences of forced labour in the past 10 years?</p>

Tab. S51 SMART Indicators for the Sub-Theme “Child Labour”

Indicator number	Indicator name (Relevance)	Indicator description
5	<p>Social responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they meet social standards / certificates?</p> <p><i>Inputs to consider: Feedstuffs, Mineral fertilisers, Organic fertilisers (if bought in)</i></p> <p><i>Assess based on the labels.</i></p> <p><i>Possible certifications/labels: Round Table on Responsible Soy (RTRS) and Pro Terra.</i></p>
514	<p>Farm inputs from countries with problematic social conditions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that farm inputs originate from countries with problematic social conditions and don't have a social certification?</p> <p><i>(Problematic regions according to ILO: Middle East, Africa, Latin America, Caribbean, Asia and the Pacific; for individual countries refer to BSCI-rating).</i></p> <p><i>If no, can information regarding the social compatibility of their production be furnished? (This relates to where the farm inputs originally came from.)</i></p>
753	<p>Child labour at suppliers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that suppliers to the farm (other operations within the farm's sphere of influence) have been involved in any incidences of child labour abuse over the past 10 years?</p> <p><i>Problematic regions according to ILO [> 5%]: Middle-East, Africa, Latin America, Asia and Pacific.</i></p>
65	<p>Proportion of products meeting social standards</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of sold products is certified to carry a social label? All social labels are valid that are recommended from WWF (2010):</p> <p>http://assets.wwf.ch/downloads/hintergrundbericht_labelratgeber_2010_def_low.pdf.</p>
423	<p>Employees: Legally binding contracts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do all of the employees have legally binding employment contracts?</p>

Indicator number	Indicator name (Relevance)	Indicator description
118	<p>Employees: Work permits</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture</p>	Do all employees have work permits and are they registered with the authorities?
440	<p>Child labour: Impairment of school performance</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If children (< 16 years old) who live on or off the farm work at the farm:</i></p> <p>Is there a risk that the children's school performance is hampered by that work (e.g., they are tired at school or do not have time to complete homework assignments)?</p> <p><i>If no children help, do not assess.</i></p>
441	<p>Child labour: Hazardous forms of work</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If children (< 16 years old) help with the work:</i></p> <p>Is there a risk that this work may be hazardous to their health or development (e.g., carrying heavy loads or doing dangerous work, applying plant protection products)?</p> <p><i>If no children help, do not assess.</i></p>

Tab. S52 SMART Indicators for the Sub-Theme "Freedom of Association and Right to bargaining"

Indicator number	Indicator name (Relevance)	Indicator description
5	<p>Social responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they meet social standards / certificates?</p> <p><i>Inputs to consider: Feedstuffs, Mineral fertilisers, Organic fertilisers (if bought in)</i></p> <p><i>Assess based on the labels.</i></p> <p><i>Possible certifications/labels: Round Table on Responsible Soy (RTRS) and Pro Terra.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
514	<p>Farm inputs from countries with problematic social conditions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that farm inputs originate from countries with problematic social conditions and don't have a social certification?</p> <p><i>(Problematic regions according to ILO: Middle East, Africa, Latin America, Caribbean, Asia and the Pacific; for individual countries refer to BSCI-rating).</i></p> <p><i>If no, can information regarding the social compatibility of their production be furnished? (This relates to where the farm inputs originally came from.)</i></p>
65	<p>Proportion of products meeting social standards</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of sold products is certified to carry a social label? All social labels are valid that are recommended from WWF (2010):</p> <p>http://assets.wwf.ch/downloads/hintergrundbericht_labelratgeber_2010_def_low.pdf.</p>
423	<p>Employees: Legally binding contracts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do all of the employees have legally binding employment contracts?</p>
463,1	<p>Employees: Permanent workforce</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the workforce is permanently employed?</p> <p><i>Permanently: Open-ended contract.</i></p>
463,2	<p>Employees: Social protection</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do all employees have social protection (including injury, illness and maternity benefits) and are protected against dismissal?</p> <p><i>Also includes family members who work on the farm.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
442	<p>Employees: Freedom of assembly and collective bargaining rights</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Are employees free to assemble and engage in (collective) bargaining?
442,1	<p>Employees: Freedom of joining unions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Are employees free to join unions?
437	<p>Employees: Overtime compensation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is overtime compensated at this farm (in terms of time off or overtime pay)?
410	<p>Relationship paid salary to regional, sector-specific minimum salary</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How does the minimum wage that the operation pays to its employees compares with the statutory minimum wage that is generally paid in this region and sector?</p> <p><i>Except apprentices.</i></p>
438	<p>Forced labour at the farm</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is there a risk that the farm was involved in any incidences of forced labour in the past 10 years?

Tab. S53

SMART Indicators for the Sub-Theme "Non Discrimination"

Indicator number	Indicator name (Relevance)	Indicator description
5	<p>Social responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they meet social standards / certificates?</p> <p><i>Inputs to consider: Feedstuffs, Mineral fertilisers, Organic fertilisers (if bought in)</i></p> <p><i>Assess based on the labels.</i></p> <p><i>Possible certifications/labels: Round Table on Responsible Soy (RTRS) and Pro Terra.</i></p>
514	<p>Farm inputs from countries with problematic social conditions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that farm inputs originate from countries with problematic social conditions and don't have a social certification?</p> <p><i>(Problematic regions according to ILO: Middle East, Africa, Latin America, Caribbean, Asia and the Pacific; for individual countries refer to BSCI-rating).</i></p> <p><i>If no, can information regarding the social compatibility of their production be furnished? (This relates to where the farm inputs originally came from.)</i></p>
445	<p>Employees: Incidences of harassment and mobbing</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Have there been any incidences of employees being harassed or mobbed in the past 5 years?</p>
456,5	<p>Clear ownership rights / social protection for partners in the event of divorce / death</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are the spouse and other dependent relatives of the farm manager provided for in the event of his or her death or in case of divorce (clear ownership rights, etc.)?</p> <p><i>Focus on social security, not on the continuity of farming.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
438	<p>Forced labour at the farm</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that the farm was involved in any incidences of forced labour in the past 10 years?</p>
455	<p>Anti-discrimination measures</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm take measures to prevent discrimination against women, minorities and vulnerable groups?</p> <p><i>Example: Contracts for all employees are based on a clear defined set of rules.</i></p>
454	<p>Commitment against discrimination</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>Only for large farms:</i></p> <p>Has the farm committed itself with a written document to prevent discrimination against women, minorities and vulnerable groups?</p>
456	<p>Equal pay</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do women, men, people with disabilities, minorities and vulnerable groups receive equal pay for equal work/output at this farm?</p> <p><i>If family workers voluntarily receive unequal pay, give a positive assessment</i></p>
458	<p>Disabled employees/inhabitants</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are there disabled people who work and/or live at this farm?</p>

Indicator number	Indicator name (Relevance)	Indicator description
412	<p>Employees: Access to external training</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the employees had access to external training in the past 5 years (at least 1 training course)? How does the farm financially support this? <i>Account for all employees, for which an external training was financed.</i></p>

Tab. S54 SMART Indicators for the Sub-Theme “Gender Equality”

Indicator number	Indicator name (Relevance)	Indicator description
5	<p>Social responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they meet social standards / certificates? <i>Inputs to consider: Feedstuffs, Mineral fertilisers, Organic fertilisers (if bought in)</i></p> <p><i>Assess based on the labels.</i></p> <p><i>Possible certifications/labels: Round Table on Responsible Soy (RTRS) and Pro Terra.</i></p>
514	<p>Farm inputs from countries with problematic social conditions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that farm inputs originate from countries with problematic social conditions and don't have a social certification? <i>(Problematic regions according to ILO: Middle East, Africa, Latin America, Caribbean, Asia and the Pacific; for individual countries refer to BSCI-rating).</i></p> <p><i>If no, can information regarding the social compatibility of their production be furnished? (This relates to where the farm inputs originally came from.)</i></p>
456,5	<p>Clear ownership rights / social protection for partners in the event of divorce / death</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are the spouse and other dependent relatives of the farm manager provided for in the event of his or her death or in case of divorce (clear ownership rights, etc.)?</p> <p><i>Focus on social security, not on the continuity of farming.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
455	<p>Anti-discrimination measures</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm take measures to prevent discrimination against women, minorities and vulnerable groups?</p> <p><i>Example: Contracts for all employees are based on a clear defined set of rules.</i></p>
460	<p>Proactive support of disadvantaged groups</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does this operation provide extra support to disadvantaged groups (women, minorities, disabled people, etc.)?</p> <p><i>Give specific examples: Financially support to women during their maternity leave, paying for the language courses of non-native speakers etc.</i></p>
454	<p>Commitment against discrimination</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>Only for large farms:</i></p> <p>Has the farm committed itself with a written document to prevent discrimination against women, minorities and vulnerable groups?</p>
456	<p>Equal pay</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do women, men, people with disabilities, minorities and vulnerable groups receive equal pay for equal work/output at this farm?</p> <p><i>If family workers voluntarily receive unequal pay, give a positive assessment</i></p>

Tab. S55 SMART Indicators for the Sub-Theme “Support to Vulnerable People”

Indicator number	Indicator name (Relevance)	Indicator description
5	<p>Social responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they meet social standards / certificates?</p> <p><i>Inputs to consider: Feedstuffs, Mineral fertilisers, Organic fertilisers (if bought in)</i></p> <p><i>Assess based on the labels.</i></p> <p><i>Possible certifications/labels: Round Table on Responsible Soy (RTRS) and Pro Terra.</i></p>
514	<p>Farm inputs from countries with problematic social conditions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that farm inputs originate from countries with problematic social conditions and don't have a social certification?</p> <p><i>(Problematic regions according to ILO: Middle East, Africa, Latin America, Caribbean, Asia and the Pacific; for individual countries refer to BSCI-rating).</i></p> <p><i>If no, can information regarding the social compatibility of their production be furnished? (This relates to where the farm inputs originally came from.)</i></p>
65	<p>Proportion of products meeting social standards</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of sold products is certified to carry a social label? All social labels are valid that are recommended from WWF (2010):</p> <p>http://assets.wwf.ch/downloads/hintergrundbericht_labelratgeber_2010_def_low.pdf.</p>
463,1	<p>Employees: Permanent workforce</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the workforce is permanently employed?</p> <p><i>Permanently: Open-ended contract.</i></p>
463,2	<p>Employees: Social protection</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do all employees have social protection (including injury, illness and maternity benefits) and are protected against dismissal?</p> <p><i>Also includes family members who work on the farm.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
445	<p>Employees: Incidences of harassment and mobbing</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Have there been any incidences of employees being harassed or mobbed in the past 5 years?</p>
455	<p>Anti-discrimination measures</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm take measures to prevent discrimination against women, minorities and vulnerable groups?</p> <p><i>Example: Contracts for all employees are based on a clear defined set of rules.</i></p>
460	<p>Proactive support of disadvantaged groups</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does this operation provide extra support to disadvantaged groups (women, minorities, disabled people, etc.)?</p> <p><i>Give specific examples: Financially support to women during their maternity leave, paying for the language courses of non-native speakers etc.</i></p>
454	<p>Commitment against discrimination</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>Only for large farms:</i></p> <p>Has the farm committed itself with a written document to prevent discrimination against women, minorities and vulnerable groups?</p>
458	<p>Disabled employees/inhabitants</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are there disabled people who work and/or live at this farm?</p>

Indicator number	Indicator name (Relevance)	Indicator description
119	<p>Apprenticeships</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are apprenticeships and/or traineeships regularly offered on the farm?</p> <p><i>Ratio of numbers of apprenticeships and other training opportunities to full time equivalent employees.</i></p>

Tab. S56 SMART Indicators for the Sub-Theme “Workplace Safety & Health Provisions”

Indicator number	Indicator name (Relevance)	Indicator description
361	<p>Cleanness of livestock / housing</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Are the animals and their environment (housing, exercise yard, fish tanks, apiary etc.) clean?</p> <p><i>Score based on the worst condition.</i></p>
363	<p>Air quality in livestock housing</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Is the air quality adequate?</p> <p><i>Score based on the worst condition.</i></p>
362	<p>Technical noise in livestock housing</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Is the technical noise pollution in the livestock housing low?</p> <p>a) Rate yes, <i>if it is possible to have a conversation at a distance of 2m when ventilation and other machinery are running in livestock housing (technical noise only)?</i></p> <p>b) <i>Score based on the worst condition.</i></p>
789	<p>On farm mechanization grade</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>To what extent is the physical workload on the farm reduced due to the degree of mechanization?</p>
628	<p>Mechanization: Milking</p> <p>Relevant for farms with the following activities: Dairy cattle / Goats / Sheep</p>	<p>To what extent does mechanization reduce the physical workload when milking?</p>

Indicator number	Indicator name (Relevance)	Indicator description
629	<p>Mechanization: Feeding roughage</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Dairy cattle / Goats / Sheep</p>	To what extent does mechanization reduce the physical workload when feeding roughage?
630	<p>Mechanization: Feeding concentrated fodder</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	To what extent does mechanization reduce the physical workload when giving concentrate fodder?
631	<p>Mechanization: Mucking out</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep</p>	To what extent does mechanization reduce the physical workload when mucking out?
511	<p>Contamination through emissions: exhaust emissions, factories or airports</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is there a risk of contamination from motorways/heavy traffic roads, industry or airports?
341	<p>Settings of combustion motors</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How often are the settings of combustion motors of vehicles (e.g. tractor, stapler) and other machineries checked and adjusted (engine, air filter etc.)? e.g.: based on exhaust emissions test results</p> <p>If no tractor is use give highest score.</p>
491	<p>Availability of regular meals, beverages and toilet facilities</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Are all employees (temporary and regular) able to have regular meals, drink sufficiently and use toilet facilities?

Indicator number	Indicator name (Relevance)	Indicator description
759	<p>Technical noise in production</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are all employees, who are exposed to noise, sufficiently protected against it?</p> <p><i>Remark: Ear protection is necessary if a conversation on a distance between 2 m is not possible.</i></p>
208	<p>Woodlands: Share of agricultural land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the farmland (all area types of the farm) is woodland?</p>
749	<p>Soil disinfection</p> <p>Relevant for farms with the following activities: Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>1) On which proportion of the agricultural area are soil disinfection chemicals (e.g. fumigation) applied?</p> <p><i>If no:</i></p> <p>2) Is documentation and justification for the use of soil disinfection products available?</p>
710	<p>Harmful substances P-fertilisers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm only use mineral P-fertilisers, which comply with the limits of harmful substances (heavy metals and uranium)?</p>
474,3	<p>Pesticides: Knowledge about active substances</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are the active substances and the risks associated to their use known to the farm manager?</p>
377,5	<p>Pesticides: Chronic toxicity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered to have adverse long term effects on the users according to the "PAN List of HHPs" or "PAN Pesticide Database"?</p>

Indicator number	Indicator name (Relevance)	Indicator description
377,75	<p>Pesticides: Acute toxicity inhalation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered acute toxic when inhaled by the users according to the "Globally Harmonized System of Classification (GHS)"?</p>
377,7	<p>Pesticides: Acute toxicity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Pesticides: Are active substances used, which are classified by the WHO as acute toxic to the health of the users?</p>
327	<p>Waste disposal: pesticides and veterinary medicines</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are all waste materials from plant protection products and veterinary medicines disposed properly? <i>Score positive if no such wastes arise</i></p>
331	<p>Waste disposal: cadaver livestock</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Are all animal wastes/cadavers disposed properly (not harm human to health and environment)? <i>Score positive if no such wastes arise</i></p>
345	<p>Irrigation: Low energy technology and pumps</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p><i>Only ask/rate if irrigation is used:</i> Does the farm use low-energy irrigation technology and pumps, drip irrigation and micro irrigation? <i>Score positively if it is done manually</i></p>
5	<p>Social responsibility in procurement</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>When purchasing farm inputs, does the farm look at whether they meet social standards / certificates? <i>Inputs to consider: Feedstuffs, Mineral fertilisers, Organic fertilisers (if bought in)</i> <i>Assess based on the labels.</i> <i>Possible certifications/labels: Round Table on Responsible Soy (RTRS) and Pro Terra.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
514	<p>Farm inputs from countries with problematic social conditions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that farm inputs originate from countries with problematic social conditions and don't have a social certification?</p> <p><i>(Problematic regions according to ILO: Middle East, Africa, Latin America, Caribbean, Asia and the Pacific; for individual countries refer to BSCI-rating).</i></p> <p><i>If no, can information regarding the social compatibility of their production be furnished? (This relates to where the farm inputs originally came from.)</i></p>
624	<p>Instruction temporary workers / visitors in handling animals</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Are temporary workers and visitors on the farm sufficiently instructed to ensure maximum animal welfare?</p>
490	<p>Employees: Regular breaks</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are all employees free to take regular breaks?</p> <p><i>Regular breaks:</i></p> <ul style="list-style-type: none"> - Long break of one hour per working day (9h) - Additional breaks (at least 0.25 h) for each half day <p><i>Example for 1 working day: 1 hour-break and 2 smaller breaks of 0.25 h.</i></p>
445	<p>Employees: Incidences of harassment and mobbing</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Have there been any incidences of employees being harassed or mobbed in the past 5 years?</p>
483	<p>Access to medical care</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do all employees (temporary and regular) have access to medical care?</p> <p><i>Include family workers and the farm manager. Both public and private health care are acceptable.</i></p> <p><i>Example: The farm provides a car to drive to a near-by hospital in case of emergency and provides coverage for treatment costs.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
492	<p>Employees: Nutritional meals</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm offer its employee's regular, nutritious meals and/or is there a kitchen where employees can prepare meals?</p>
440	<p>Child labour: Impairment of school performance</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If children (< 16 years old) who live on or off the farm work at the farm:</i></p> <p>Is there a risk that the children's school performance is hampered by that work (e.g., they are tired at school or do not have time to complete homework assignments)?</p> <p><i>If no children help, do not assess.</i></p>
441	<p>Child labour: Hazardous forms of work</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If children (< 16 years old) help with the work:</i></p> <p>Is there a risk that this work may be hazardous to their health or development (e.g., carrying heavy loads or doing dangerous work, applying plant protection products)?</p> <p><i>If no children help, do not assess.</i></p>
464	<p>Systematic identification of potential safety hazards</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>For smallholders and family farms:</i></p> <p>Is the farm manager aware of all relevant potential safety hazards?</p> <p><i>For large operations:</i></p> <p>Are safety hazards systematically identified and recorded?</p>
790	<p>Employees: Use of protective gear</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Bees, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farmer ensure that workers have appropriate protection during their application of pesticides and other hazardous materials?</p>

Indicator number	Indicator name (Relevance)	Indicator description
470	<p>Certification for the use of plant protection and animal treatment products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the farm certified to use plant protection and animal treatment products (e.g., EUREPGAP or similar certification, training by the extension service)?</p> <p><i>In the case that only one expertise is needed and fulfilled: Rate "yes".</i></p>
473	<p>Employees: Training for use of plant protection and animal treatment products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If the operation has no certification:</i></p> <p>Are employees trained in the use and storage of plant protection and animal treatment products?</p> <p><i>In the case that only one expertise is needed and fulfilled: Rate "yes".</i></p>
485	<p>Storage of other hazardous substances</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If other hazardous, besides plant protection and animal treatment products, substances are used:</i></p> <p>Are they stored safely?</p> <p><i>No other hazardous substances = yes</i></p>
474	<p>Days of absence due to occupational injuries and work-related illnesses</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>How many days (per person per year) of absence due to occupational injuries and work-related illnesses have there been in the past 5 years?</p>

Indicator number	Indicator name (Relevance)	Indicator description
469	<p>Management system for workplace safety and health</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is there a professional management system for workplace safety and health in place to reduce the risk of injuries and illnesses relating to work?
515	<p>Subsistence farming</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture, Tropical crops</p>	To what extent does the farm supply its own food needs and those of its employees, as far as the local environmental conditions allow?

Tab. S57 SMART Indicators for the Sub-Theme “Public Health”

Indicator number	Indicator name (Relevance)	Indicator description
789	<p>On farm mechanization grade</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	To what extent is the physical workload on the farm reduced due to the degree of mechanization?
378	<p>Distance manure heap to waters</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tropical crops</p>	Is the shortest distance between the “worst” of the storage facilities for livestock wastes or silage and the nearest water resource (well, open drain, sewer, river) more than 30m?

Indicator number	Indicator name (Relevance)	Indicator description
380	<p>On-farm point sources of nutrients and pollutants</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Can it be excluded that there are direct point source emissions of nutrients and pollutants to the atmosphere and water bodies (incl. wells and drinking water sources) on the farm and its utilized areas? <i>e.g. exports (= emissions through discharge and degas) from exercise yards, farmyard manure stores, livestock water facilities or shelter of animals near to water on pastures, direct entry of animals into the water and cleaning areas.</i></p>
511	<p>Contamination through emissions: exhaust emissions, factories or airports</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk of contamination from motorways/heavy traffic roads, industry or airports?</p>
200	<p>Covered slurry stores (or stable natural crust)</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep</p>	<p><i>Only ask/rate if slurry occurs:</i> Are slurry stores covered or does a stable natural crust cover the surface?</p>
605	<p>Management of riparian strips</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are the riparian strips extensively managed (minimum width 3m, no cultivation, no fertilizers, no pesticides)?</p>
208	<p>Woodlands: Share of agricultural land</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the farmland (all area types of the farm) is woodland?</p>

Indicator number	Indicator name (Relevance)	Indicator description
301	<p>Contamination tests before using bought-in fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>Only in cases, in which external organic fertilizers are applied (e.g. compost, sewage, sludge):</i></p> <p>Are only substances applied (e.g. composts, sewage sludge, wastewater) that have been tested for contamination beforehand (primarily heavy metals, antibiotics) and found to be safe?</p> <p><i>Rate positive if fertilizers from other organic farms are applied.</i></p>
294	<p>Soil analyses for heavy metals</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Have soil analyses been carried out over the past 20 years with a view to assessing heavy metal contamination (of soils or ponds), and, in case of positive tests, were further monitoring analyses undertaken?</p>
606	<p>Landslides and mudslides on agricultural area</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Tropical crops</p>	<p>Were there landslides and/or local mudslides on the farms agricultural area in the past 10 years?</p>
749	<p>Soil disinfection</p> <p>Relevant for farms with the following activities: Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>1) On which proportion of the agricultural area are soil disinfection chemicals (e.g. fumigation) applied?</p> <p><i>If no:</i></p> <p>2) Is documentation and justification for the use of soil disinfection products available?</p>
320	<p>Crop resistance</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Are cultivars chosen with a view to resistance to harmful organisms and diseases?</p>
295	<p>Antibiotics from livestock in fertilizers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that manure/slurry from livestock treated with antibiotics is applied to the agricultural area?</p>

Indicator number	Indicator name (Relevance)	Indicator description
201	<p>Slurry application with drag hose system or by injection</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Permanent grassland, Tree nursery / perennials</p>	<p><i>Only ask/rate if slurry occurs:</i></p> <p>On what proportion of the agricultural area does the farm use drag hose or injection systems to apply slurry?</p>
178	<p>Waiting period between animal manure and harvest</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are the waiting periods between the last application of animal manure and the product harvest adequate?</p> <p><i>Look up the legal provisions before or after the interview.</i></p>
710	<p>Harmful substances P-fertilisers</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm only use mineral P-fertilisers, which comply with the limits of harmful substances (heavy metals and uranium)?</p>
231	<p>No use of synth. chem. herbicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the agricultural area does not receive synthetic chemical herbicide applications?</p>
233	<p>No use of synth. chem. fungicides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the agricultural area does not receive synthetic chemical fungicide applications?</p>
234	<p>No use of synth. chem. insecticides</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>What proportion of the agricultural area does not receive synthetic chemical insecticide applications?</p> <p><i>Spinosad, Neem and other broad-range organic insecticides count.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
377,1	<p>Pesticides: Number of active substances</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	How many active substances of pesticides are used per year?
257,2	<p>Pesticides: Toxicity aquatic organisms</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered to be toxic to aquatic organisms according to the "PAN Pesticide Database"?</p> <p><i>The strongest impact on organisms of all active ingredients used is assessed</i></p>
257,1	<p>Pesticides: Toxicity bees</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Pesticides: Are active substances used, which are considered toxic to bees according to the "PAN Pesticide Database"?</p> <p><i>The strongest impact on bees of all active ingredients used is assessed</i></p>
474,1	<p>Pesticides: Persistence water</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Pesticides: Are active substances used, which are considered very persistent in water (half-life > 60 days) according to the "PAN Pesticide Database"?
474,2	<p>Pesticides: Persistence soil</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Pesticides: Are active substances used, which are considered to be very persistent in soil (half-life > 180 days) according to the "PAN Pesticide Database"?
474,3	<p>Pesticides: Knowledge about active substances</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Pesticides: Are the active substances and the risks associated to their use known to the farm manager?
377,5	<p>Pesticides: Chronic toxicity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Pesticides: Are active substances used, which are considered to have adverse long term effects on the users according to the "PAN List of HHPs" or "PAN Pesticide Database"?

Indicator number	Indicator name (Relevance)	Indicator description
377,75	<p>Pesticides: Acute toxicity inhalation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Pesticides: Are active substances used, which are considered acute toxic when inhaled by the users according to the "Globally Harmonized System of Classification (GHS)"?
377,7	<p>Pesticides: Acute toxicity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Pesticides: Are active substances used, which are classified by the WHO as acute toxic to the health of the users?
740	<p>Growth regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farm decline to use synthetic chemical growth regulators ?
747	<p>Flowering regulation</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Does the farm use products to influence the flowering of plants or for desiccation ? <i>Rate positive for nature identical ethylene gas.</i>
376,1	<p>Information on water availability</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	In case there is a risk of temporary water scarcity, does the farm have access to information on water availability (e.g. groundwater level)?
376,2	<p>Information on water quality</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Does the farm have access to information on water quality (analysis of water quality)?

Indicator number	Indicator name (Relevance)	Indicator description
398	<p>Use of non-renewable (fossil) water resources</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is there a risk that water from non-renewable (fossil) water resources is used on the farm?
377,05	<p>Wastewater: Disposal</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is all wastewater produced on the farm correctly discharged (into sewer for treatment)?
357	<p>Mutilation: Use of anaesthetics and analgesics</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Dairy cattle / Goats / Sheep</p>	Are anaesthetics and analgesics used when animals are mutilated?
609	<p>Waiting period for milk deliveries after usage of antibiotics</p> <p>Relevant for farms with the following activities: Dairy cattle / Goats / Sheep</p>	Does the farm always adhere to the waiting period for milk deliveries after using antibiotics or even extend the period?
352	<p>Livestock health: Proportion of curative treatments</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	What proportion of the animals (across all livestock categories) received curative antibiotics treatments (for actual illnesses) during the last year?
353	<p>Livestock health: Proportion of prophylactic treatments</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	What proportion of the animals (across all livestock categories) was given prophylactic treatments, preventive before any clinical signs of disease, including for purposes of enhanced performance, during the past year?

Indicator number	Indicator name (Relevance)	Indicator description
327	<p>Waste disposal: pesticides and veterinary medicines</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Are all waste materials from plant protection products and veterinary medicines disposed properly? <i>Score positive if no such wastes arise</i></p>
334	<p>Recycling of waste oil</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the used oil is delivered to recycling points?</p>
334,2	<p>Recycling of used batteries</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of used batteries is delivered to recycling points?</p>
334,3	<p>Recycling of plastic waste</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>What proportion of the plastic waste is delivered to recycling points?</p>
331	<p>Waste disposal: cadaver livestock</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Aquaculture</p>	<p>Are all animal wastes/cadavers disposed properly (not harm human to health and environment)? <i>Score positive if no such wastes arise</i></p>
788	<p>Open burning of farm or household wastes and bushes</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm refrain from burning of bushes, crop residues and household/farm wastes?</p>

Indicator number	Indicator name (Relevance)	Indicator description
34,2	<p>Use of chem. synth. seed dressings</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Does the farm refuse to use seeds dressed with synthetic chemicals?
519	<p>Use of GMO-crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Is there a risk that GMO crops are grown at the farm?
34	<p>Use of GMO-feedstuff</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is there a risk that the farm is using GMO feedstuff?
34,1	<p>Use of nanotechnology-based products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is there a risk that nanotechnology products are used on the farm?
403	<p>Conflicts over water quantity</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Are there, or have there been, any conflicts with other water users / stakeholders in the farm's neighbourhood over access to water and the volume of water used ?
402	<p>Conflicts over water quality</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Are there, or have there been, any conflicts with other water users / stakeholders over water quality in the farm's neighbourhood?

Indicator number	Indicator name (Relevance)	Indicator description
170	<p>Food safety standard</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture, Tropical crops</p>	<p>Does the farm comply with any voluntary standard, on top of legal requirements, covering food safety?</p> <p><i>Examples: GlobalGap, IFS, etc.</i></p>
167	<p>Contaminated products</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Have any contaminated products returned to the farm in the last 5 years that posed a risk for food safety?</p>
169	<p>Cases of contamination: Measures</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If contaminated products have left the farm:</i> Have steps been taken to prevent this in future?</p> <p><i>If no contaminated products have left the farm:</i> Are there measures to prevent contaminated products from leaving the farm?</p> <p><i>Do not ask about the following aspects as they are covered by other indicators: antibiotics, cell counts for milk</i></p>
610	<p>Residues of antibiotics in milk</p> <p>Relevant for farms with the following activities: Dairy cattle / Goats / Sheep</p>	<p>Were there complaints from the dairy manufacturers regarding residues of antibiotics in the past 5 years?</p>
790	<p>Employees: Use of protective gear</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Bees, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farmer ensure that workers have appropriate protection during their application of pesticides and other hazardous materials?</p>
485	<p>Storage of other hazardous substances</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p><i>If other hazardous, besides plant protection and animal treatment products, substances are used:</i> Are they stored safely?</p> <p><i>No other hazardous substances = yes</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
502	<p>Public health measures</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm support or offer health measures / projects for the general public?</p> <p><i>Examples: Provide courses for free to the public e.g. related to healthy foods or lifestyle.</i></p>
506	<p>Food security measures for local communities</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Aquaculture, Tropical crops</p>	<p>Does the farm take steps / implement projects to enhance the food security of the local community, or does it financially support such efforts?</p> <p><i>Examples: Teach other farmers how to store or to further process raw products.</i></p>

Tab. S58 SMART Indicators for the Sub-Theme “Indigenous Knowledge”

Indicator number	Indicator name (Relevance)	Indicator description
519	<p>Use of GMO-crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Is there a risk that GMO crops are grown at the farm?</p>
34	<p>Use of GMO-feedstuff</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that the farm is using GMO feedstuff?</p>
67	<p>Prevention of resource conflicts</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Does the farm have mechanisms for preventing the use of resources that have been, or are, legally disputed, or whose ownership is unclear (water, land, biodiversity, etc.)?</p> <p><i>E.g. use a movable fence to avoid grazing conflicts or involvement of concerned stakeholders to commonly set basic rules for the use of water.</i></p>

Indicator number	Indicator name (Relevance)	Indicator description
505	<p>Recognition / payment for traditional or indigenous knowledge</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that the farm uses methods / resources (in particular if they are based on patents), which originate from traditional knowledge of people / population groups that have not been compensated for the commercial use of this traditional knowledge?</p> <p><i>Example: As a precautionary principle, the farmer does not use patented seeds.</i></p>
75	<p>Social involvement outside the farm: Costs</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is the farm involved in social matters (not paid for) in the community? If yes, how many days on average per year are taken for this commitment?</p>

Tab. S59 SMART Indicators for the Sub-Theme “Food Sovereignty”

Indicator number	Indicator name (Relevance)	Indicator description
767	<p>Land ownership</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farmer have secure tenure rights over the land for at least 10 years?</p>
223	<p>Rare or endangered agricultural crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	<p>How many rare or endangered agricultural crops are grown on the farm?</p> <p><i>Including crop species and cultivars.</i></p>
247	<p>Hybrid cultivars</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Permanent grassland, Pot plants / Plant nursery, Tropical crops</p>	<p>Does the farm decline to cultivate hybrid cultivars?</p>

Indicator number	Indicator name (Relevance)	Indicator description
320	<p>Crop resistance</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Are cultivars chosen with a view to resistance to harmful organisms and diseases?
245	<p>Locally adapted livestock breeds</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	Are locally adapted livestock breeds kept on the farm?
246	<p>Rare and endangered livestock breeds</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Aquaculture</p>	Are rare or endangered livestock breeds kept on the farm?
249	<p>Hybrid livestock (poultry, pigs)</p> <p>Relevant for farms with the following activities: Pig production, Poultry production, Bees, Aquaculture</p>	Does the farm keep hybrid livestock (of poultry or pigs)?
517	<p>Feed No Food: grazing livestock</p> <p>Relevant for farms with the following activities: Beef cattle, Dairy cattle / Goats / Sheep</p>	What proportion of the feed given to grazing livestock would be suitable for human consumption (For maize silage take standard yields for grain maize)?
518	<p>Feed No Food: non-grazing animals</p> <p>Relevant for farms with the following activities: Pig production, Poultry production, Aquaculture</p>	<p>What proportion of the feed given to non-grazing animals would be suitable for human consumption?</p> <p><i>Contrary to e.g. waste products</i></p> <p><i>Score based on worst animal category</i></p>
519	<p>Use of GMO-crops</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Tree nursery / perennials, Pot plants / Plant nursery, Tropical crops</p>	Is there a risk that GMO crops are grown at the farm?
34	<p>Use of GMO-feedstuff</p> <p>Relevant for farms with the following activities: Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	Is there a risk that the farm is using GMO feedstuff?

Indicator number	Indicator name (Relevance)	Indicator description
514	<p>Farm inputs from countries with problematic social conditions</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that farm inputs originate from countries with problematic social conditions and don't have a social certification?</p> <p><i>(Problematic regions according to ILO: Middle East, Africa, Latin America, Caribbean, Asia and the Pacific; for individual countries refer to BSCI-rating).</i></p> <p><i>If no, can information regarding the social compatibility of their production be furnished? (This relates to where the farm inputs originally came from.)</i></p>
791	<p>Household food security</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Do all members of the farm household have adequate nutritional meals each day?</p>
513	<p>Dispossession of smallholders / local communities</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Pot plants / Plant nursery, Aquaculture, Tropical crops</p>	<p>Is there a risk that smallholders or local communities were dispossessed (without adequate compensation) in order to establish this farm?</p>
506	<p>Food security measures for local communities</p> <p>Relevant for farms with the following activities: Arable farming, Vegetable production, Fruit production, Viticulture, Permanent grassland, Beef cattle, Pig production, Poultry production, Bees, Dairy cattle / Goats / Sheep, Tree nursery / perennials, Aquaculture, Tropical crops</p>	<p>Does the farm take steps / implement projects to enhance the food security of the local community, or does it financially support such efforts?</p> <p><i>Examples: Teach other farmers how to store or to further process raw products.</i></p>