Sustainability Assessment of Food and Agriculture Systems (SAFA)

Guidelines

Draft 4.0 – compact version

Natural Resources Management and Environment Department
Food and Agriculture Organization of the United Nations
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Summary

Twenty years have passed since the principle of sustainable development received almost universal agreement at the 1992 Earth Summit. Recent years have seen impressive progress in the realization of a socially, economically and environmentally sustainable development. Stakeholders in the food and agriculture sectors have been at the forefront of this progress, improving agricultural productivity, protecting human and natural resources, and conceiving and implementing frameworks, standards and *indicators** [1] for assessing and improving sustainability across the sector and along the value chain. Yet, enormous challenges remain. The world is confronted with a multitude of crisis, from food and fuel crises to climate and financial crises. To further enhance the efficacy and efficiency of the various initiatives in tackling these challenges, a common language for sustainable agriculture and food systems is needed.

As a contribution to developing such a common language, and as part of its efforts for the 2012 United Nations Conference on Sustainable Development (UNCSD), FAO built on existing knowledge and, through a transparent and participatory process, developed the present voluntary Guidelines for Sustainability Assessment of *Food and Agriculture Systems** (SAFA). A SAFA is the rating of a company's or production site's sustainability *performance**. The Guidelines specify the procedure, principles and minimum requirements for a SAFA. They are goal-oriented and serve as a benchmark stating what sustainable agriculture entails. The guiding vision of SAFA is a globally sustainable food and agriculture sector, characterised by environmental integrity, economic resilience, social well-being and good *governance** throughout the sector. The SAFA Guidelines are meant to support a sustainability management that facilitates progress towards this vision all over the sector, from production to processing and distribution of food and agricultural products.

The target audience of the SAFA Guidelines are agricultural producers, food manufacturers and retailers who wish to substantiate sustainability claims, as well as entities doing sustainability analyses on behalf of these stakeholders. The Guidelines are a globally applicable template for assessments of the sustainability of food and agriculture systems, providing guidance on the procedure of developing and applying a sustainability assessment system, and including a *generic** set of core sustainability categories, possible indicators for performance assessment, and minimum criteria for sustainability. They set a frame to which existing systems can be related and on which new assessment methods can be based. Furthermore, companies, organisations and other stakeholders who want to improve the sustainability performance of their supply chains are encouraged to take up the SAFA Guidelines as a framework for developing their own *product** category rules for supply chains. This will enable others to benchmark their activities and eventually allow a dynamic improvement of food chains. The methodological principles of this frame are relevance, simplicity, goal-orientation and performance-orientation. At the instutional level, the Guidelines build on and acknowledge existing standards, attempt to add value rather than duplicate, and represent an open and learning system.

Sustainability assessments based on the SAFA Guidelines shall primarily serve purposes of internal management and business-to-business communication. For internal sustainability management as well as for a start, assessments based on the Guidelines can take the form of a self-evaluation. Where sustainability performance is to be reported to business partners, consumers or authorities, independent third-party measurement, reporting and verification will be necessary.

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1 Terms written in italics and marked with an asterisk at first mention are defined in the Glossary.

List of abbreviations

B2B	business-to-business
B2C	business-to-consumer
BLIHR	Business Leaders Initiative on Human Rights
BSCI	Business Social Compliance Initiative
CBD	Convention on Biological Diversity
COSA	Committee on Sustainability Assessment
ECOSOC	United Nations Economic and Social Council
FAO	Food and Agriculture Organization of the United Nations
FLO	Fairtrade Labelling Organizations International
FSC	Forest Stewardship Council
GHG	greenhouse gas
GRI	Global Reporting Initiative
IISD	International Institute for Sustainable Development
ILO	International Labour Organization
ISEAL Alliance	International Social and Environmental Accreditation and Labeling Alliance
ISO	International Organization for Standardization
ITC	International Trade Centre
LCA	Life-Cycle Assessment
MSC	Marine Stewardship Council
NGO	non-government organisation
OECD	Organisation for Economic Co-Operation and Development
PCR	Product category rules
RISE	Response-Inducing Sustainability Evaluation
SAFA	Sustainability Assessment of Food and Agriculture systems
SAI Platform	Sustainable Agriculture Initiative
UNCSD	United Nations Conference on Sustainable Development
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNGC	United Nations Global Compact
WBCSD	World Business Council for Sustainable Development
WHO	World Health Organization
WWF	World Wide Fund for Nature

Contents

The structure of these guidelines draws upon ISO[2] 14040:2006 (ISO, 2009), the ISEAL[3] Code of Good Practice (version 1.0; ISEAL Alliance, 2010) and the Sustainability Reporting Guidelines and the Food Sector Supplement of the Global Reporting Initiative[4] (version 3.1; GRI, 2011a; 2001b). Taking these widely acknowledged guidelines as a basis, those parts which are relevant for the food and agriculture sectors were chosen and selected, along the whole supply chain from farm to retailer. The structure of the category protocols in chapter 4 is based upon GRI (2011), the RISE[5] method (Grenz et al., 2011) and the description of the German KSNL[6] method (Breitschuh et al., 2008).

Paragraphs, in which principles of SAFA development and implementation are conveyed, are highlighted in blue.

Paragraphs, which refer to a need for transparent documentation during the SAFA process, are highlighted in green.

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2 International Organization for Standardization

3 International Social and Environmental Accreditation and Labelling Alliance

4 Global Reporting Initiative

5 Response-Inducing Sustainability Evaluation, a method for farm-level sustainability assessment

6 Kriteriensystem nachhaltige Landwirtschaft, a method for farm-level sustainability assessment

1. Introduction to the SAFA Guidelines

1.1 Rationale

Sustainable development – progress and challenges

The ecological, economic and social principles of sustainable development received almost universal agreement at the 1992 Earth Summit. One of the summit's major outcomes, Agenda 21, includes a whole chapter (Chapter 14) on sustainable agriculture and rural development. Much progress has been made in the two decades since 'Rio'. For almost all the social and economic Millennium Development Goals, improvements have been substantial (UN, 2011). Global per capita Gross National Income has more than doubled between 1992 and 2010 (from 5035 current international USD at PPP to 11058; World Bank, 2011). Yet, reaching the poorest, all over the world, remains a challenge (UN, 2011). The number of undernourished people was estimated by FAO to be 925 million in 2010. This number has increased by approximately 75 million people since 1990-92, one reason being economic turbulence since 2008 (FAO, 2010). For the environmental dimension of sustainability, Rockström et al. (2009) postulate that humanity has already transgressed three of the planetary boundaries within which we can operate safely: for climate change, biodiversity loss and changes to the global nitrogen cycle. The boundaries for ocean acidification and, possibly, the global phosphorus cycle may be close to being crossed.

Primary production is a major contributor to the human footprint in all of these aspects. For example, 31% of global greenhouse gas emissions have been attributed to agriculture and forestry (IPCC, 2007). Agriculture alone accounts for 70% of global freshwater withdrawals (FAO, 2011a). On the other hand, farming, animal husbandry, forestry and fisheries not only produce the basis of humanity's life, but also provide livelihoods for more than 2.6 billion people (FAOSTAT, 2011), including many of the world's poor. Agricultural land and forests occupy more than 60% of terrestrial surface, fishery activities can be found on virtually any water body. The primary sector is the custodian of much of Earth's surface.

One approach to tackle the risk of the human economy's overstraining the capacities of Earth's ecosystems is the concept of a "green economy" that respects planetary boundaries and adopts eco-efficiency as a guiding principle. This concept offers opportunities for the primary sector, the only part of the economy that is "green *sensu strictu*", i.e. biologically productive. However, it also brings about major challenges e.g. in relation with freedom and distributional equity (UNDP, 2011). Likewise, supply networks and value chains have grown in scale and complexity, and so have opportunities for companies to promote high social and environmental standards (UNGC & BSR, 2010). Using these opportunities is the goal of FAO's activities under the heading "Greening the Economy with Agriculture"[7].

Need for a common language

Recent years have seen not only the rise of the "green economy"[8] concept, but also the development of frameworks, initiatives, standards and indicators for assessing and improving the environmental and social *impacts** of production of various sectors, including the agriculture and food sectors, at different scales. More than one hundred countries have established national strategies for sustainable development, which also include sustainability targets and indicators to measure their efforts to achieve them. Many companies in the food and agriculture industries have adopted concepts such as corporate social responsibility,

7 www.fao.org/rio20/fao-rio-20/gea/en

8 An economy „that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities" (UNEP, 2010).

creating shared value, responsible supply chain management and the triple bottom line. These concepts are put into practice through internal management, B2B and B2C communication. Systems for independent, third-party verification, certification and accreditation have been established.

Of the many standards and verification systems, tools, databases, initiatives and approaches[9] for measuring, communicating and improving the sustainability, the environmental impact or the social impact of agricultural production, forestry, fisheries and aquaculture, few cover the whole value chain and all dimensions of sustainability. Concerning the development and application of sustainability systems and frameworks, small and medium enterprises, the poor and developing countries are less represented than large companies and stakeholders from industralised countries, despite most systems' building on transparent and participative mechanisms.

Despite the numerous valuable efforts for making sustainability assessments in the food and agriculture sector more accurate and easier to manage, yet no internationally accepted benchmark defines what 'sustainable food production' actually entails. Neither a commonly accepted set of categories that have to be taken into account when measuring sustainability performance, nor widely accepted definitions of the minimum requirements that would allow a company to qualify as 'sustainable', exist. Appraising the sustainability claims of a company remains difficult, for producers and consumers alike.

Purpose of the SAFA Guidelines

With a view to offer a fair playing field, FAO has built on existing efforts and developed these Guidelines for Sustainability Assessment of Food and Agriculture systems (SAFA) as part of its efforts for the 2012 United Nations Conference on Sustainable Development (UNCSD). In line with the FAO mandate[10], the overarching goal of this endeavour is to contribute to improved sustainability performance of the food and agriculture sectors. This shall be achieved by enhancing the transparency and comparability of the sustainability performance of companies. The intent is to provide a benchmark that defines what sustainable food production is, as well as a template for agriculture and food sustainability assessment, for the use by primary producers, food manufacturers and retailers who wish to substantiate sustainability claims. Indicator systems and tools for the Sustainability Assessment of Food and Agriculture systems can be related to the Guidelines or built upon them.

1.2 How the SAFA Guidelines were developed

The present Guidelines were iteratively developed from 2009 to 2012 through repeated phases of review, stakeholder participation and text elaboration. The continuous, participatory improvement of the SAFA Guidelines will continue beyond 2012.

First review and consultation (2009-2010)

The first iteration of the framework resulted from a review of a range of governmental, private, non-governmental and research institutions materials. This included the (then draft) ISEAL Impacts Code and established sustainability frameworks, drawing notably from the Brundtland Commission's report of 1987 'Our Common Future' (WCED, 1987). This was complemented with information from a range of UN bodies (e.g. UN/ECOSOC, FAO, ILO, UNEP), other normative references, corporate tools (e.g. WalMart Sustainability Index), NGO

9 All of these will be termed „systems" in the following.

10 www.fao.org/about/en

tools (e.g. Transparency International), research materials (e.g. the Stiglitz-Sen-Fitoussi Report[11]), social and environmental voluntary standards (g. Organic, FLO, MSC, Utz Certified) and other resources (e.g. the ITC's Trade for Sustainable Development project). An expert meeting held in FAO in September 2009 helped discuss core sustainability issues from environmental, social, economic and governance perspectives. This, together with a mapping of existing performance indicators of food chain actors resulted in a draft Sustainability Framework.

E-forum (early 2011)

Public comments were sought during a five-week E-forum on Sustainability Assessment of the Food Chain through the portal www.fao.org/rio20/e-forum, from 21 February to 25 March, 2011. Draft SAFA goals and scope, derived from the 2009 consultation and another round of reviews were made available to the E-forum participants. A broad range of stakeholders from industry, science, international institutions and civil society were invited to participate. The discussion was structured according to the sustainability dimensions of the draft indicator set, namely environmental integrity, economic resilience, social well-being and good governance. Each week, specific questions concerning the respective domain were posted. A total of 246 people from 61 countries registered as Forum participants. Weekly summaries and a synthesis document were posted on the forum portal.

Stakeholder survey (summer of 2011)

From April to August, 2011, the Swiss College of Agriculture, with the support of FAO and the Research Institute of Organic Agriculture (FiBL), undertook a stakeholder survey, during which experts from food and agriculture industry, public administration, NGOs, multistakeholder roundtables and multilateral institutions were invited to openly have their say, in a telephone interview or by filling out a questionnaire, on the purposes and contents of the SAFA initiative. Intensive feedback was received from 18 industry and multistakeholder institutions, 15 NGO/public and 8 science stakeholders. Most participants declared their interest in further participating in SAFA discussions. Parallel to the survey, 10 international conferences and meetings with a stake in sustainable food production and consumption and in sustainable finance were attended, where further discussions with stakeholders from industry and science took place.

Review and cross-comparison of standards and indicator sets (autumn-winter of 2011)

An extensive screening of mono- and multidimensional sustainability standards, indicator systems, initiatives and regulations was done, combined with an in-depth literature survey. A total of 82 systems were identified, not including those at the national level (e.g. BioSuisse or Naturland standards). In order to refine the set of SAFA indicator topics, a detailed cross comparison of topics treated in indicator sets and standards systems was done, which finally encompassed 44 systems: 18 industry standards, 5 farm-level systems, 4 systems of multilateral institutions, 7 NGO systems, 5 roundtable standards and 5 systems belonging to other types.

Elaboration and publication of the Guidelines (spring of 2012)

11 www.stiglitz-sen-fitoussi.fr/documents/rapport_anglais.pdf

1 (To be completed)

3. The SAFA Guidelines

In a nutshell

A SAFA is the holistic rating of the sustainability performance of a company or production site which is part of a food supply chain. Its main purpose is to support effective sustainability management, i.e. a continuous improvement towards environmental integrity, economic resilience, social well-being and good governance, at the levels of production site, company and value chain. A SAFA can take the form of a self-evaluation. Where sustainability performance is to be reported to business partners, consumers or authorities, independent measurement, reporting and verification are required. The establishment of structures for independent verification and accreditation lies beyond the scope of the Guidelines. The Guidelines specify the principles, procedure and minimum requirements for a SAFA. Their target audience are agricultural producers, food manufacturers, whole salers and retailers who wish to substantiate sustainability claims, as well as entities doing sustainability analyses on behalf of these stakeholders.

Sustainability management

The vision of SAFA is a situation where activities contribute to a sustainable development in the sense of the guiding vision, all along the value chain. It is presumed that while some stakeholders may be "sustainable by default", e.g. by having only a minimal environmental impact without active management of the processes causing these impacts, the normal case will be one where a targeted sustainability management gives better results. Ideally, sustainability should be managed explicitly and in a holistic manner, conceiving the firm and its environment as a whole (Porter, 2008). Yet in reality, most sustainability assessment systems including those based on the SAFA Guidelines rate sustainability topic by topic. In SAFA as well, effective albeit disjunct management of many individual aspects of sustainability will result in high sustainability scores.

Sustainability management comprises a sequence of activities, as illustrated in the United Nations Global Compact Management Model (UNGC, 2010; Tab. 1). A SAFA is part of the two "Assess" steps of sustainability management. It feeds the "Implement" step via feedback on the results of implemented measures, and the "Communicate" step via the provision of communicable information on sustainability performance.

Table 1. Steps in sustainability management (modified after UNGC, 2010). A SAFA contributes to the two "Assess" steps ("before" = first assessment, "after" = monitoring).

Commit	mainstream sustainability principles into strategies and operations, in a transparent way
Assess (before)	assess risks, opportunities and performance across sustainability issues
Define	define goals, strategies and policies
Implement	implement strategies and policies through the company and across the value chain
Assess (after)	monitor performance and track progress toward goals
Communicate	communicate progress and strategies, engage with stakeholders for continuous improvement

The mere existence of sustainability goals or management plans in a company (steps "Commit" to "Define") and the company's participation in systems with sustainability claims (step "Implement") are not normally rated in SAFA. The reason for this is that the evidence for significant effects of the participation e.g. in certification systems is yet too weak to universally and directly infer an enhanced performance (e.g. Beuchelt & Zeller, 2011; Blackman & Rivera, 2011). The same applies to the link between the sustainability goals and sustainability performance of companies. However, participation in a system can substantially ease data collection for SAFA where information on one or several of the SAFA sustainability

issues has already been collected e.g. for an audit, or must be documented regularly. Companies that participate in one or several systems with sustainability claims can use the SAFA Guidelines to identify areas that have not yet been covered by their sustainability management. For sustainability categories, for which no measures of performance and no minimum sustainability requirements can be defined, measures taken e.g. in the context of participation in a system with sustainability claims, may be rated.

3.1 Aims, audience and principles of SAFA

3.1.1 Vision and goals

Vision

The guiding vision of SAFA is a sustainable development of the food and agriculture sector, understood as a development that is environmentally benign, socially just and economically viable through good governance.

Long-term goal

The goal of these Guidelines is to contribute to the vision's becoming a reality, by supporting all stakeholders in the agriculture and food sectors in implementing an effective sustainability management. This shall be achieved through the development, dissemination and continuous improvement of a generic, science-based methodology for holistic, performance-oriented sustainability assessments of food and agriculture systems.

3.1.2 Roles and responsibilities

Audience

The SAFA guidelines are intended for use by primary producers, food manufacturers and retailers, primarily in internal management and for B2B communication. These stakeholders will either commission independent audits by third parties, or they will conduct self-declaratory assessments themselves. In both cases, the generic framework provided by these guidelines has to be concretised and adapted to regional, sectoral and individual circumstances. This must be done in a transparent (see section 3.6.8) and responsible manner.

*Auditors**

Initially, SAFA can take the form of self-evaluations. The accordant audits can be conducted both by staff of the company itself or by qualified evaluators. A specification of the necessary qualifications that could serve as a basis for auditor accreditation is not foreseen at this point, but may be elaborated in the future. Once structures for verification and accreditation are established, SAFA can be done by independent third parties, if sustainability claims are to be communicated to business partners, the public or administration. Where a SAFA is part of a formal certification procedure, compliance with the respective rules for certification and accreditation has to be ensured. The auditor's responsibilities are subject to contractual arrangements between the commissioning and the auditing company.

Provider

The SAFA Voluntary Guidelines are provided by FAO. They are publicly available and no license fees may be charged for their use as such. The correct application of the Guidelines is the responsibility of the implementing company. FAO assumes no liability for consequences of using the SAFA Guidelines.

3.1.3 Subject and scope

Subject of SAFA

A SAFA is an assessment of economic, environmental, social and governance sustainability. All SAFA indicators are performance indicators, i.e. they measure the degree to which the operations of the company are in accordance with the sustainability goals stated for the respective sustainability category (for further definitions, see the Glossary). A SAFA can address all entities along value chains based on primary production, from the site of primary

production (agriculture, fisheries, forestry) to that of final sales to the consumer (Fig. 1). The use and end-of-life phases of products (ISO 14040, 2009) are not covered by SAFA.
The assessment takes the form of an audit at the levels of a production site, a company, or a branch of a company. Data collected during and generated following audits in the context of existing systems should be used for SAFA to the greatest extent possible. Where all SAFA sustainability categories are adequately covered, no additional audit needs to be done. A SAFA can adapt a life cycle approach. Sustainability scores of production sites can be aggregated (bottom-up) to obtain one company score per sustainability category.

The range of situations where SAFA can be applied is very wide in terms of geography, industry sector, socio-economic context, type and size of enterprise, data availability and quality. Adapting the generic framework provided by the Guidelines to these situations is crucial for obtaining accurate and useful results. For example, as water scarcity strongly varies between watersheds (Pfister et al., 2009), quantities of freshwater consumption that are equal in absolute terms have different impacts on the regional sustainability of water use, and must hence be rated differently.

Physical scope

A SAFA covers the company's sphere of impact and influence. This includes processes (i) that are an inseparable part of production resp. of the chain, (ii) that generate significant sustainability impact (actual and potential) and (iii) over which the assessed entity exerts control or significant influence regarding financial and operating policies and practices (GRI, 2011). In cases of doubt, the substantiality of impact and scope of action of the company and the chain can serve as *cut-off criteria**. For example, the physical – and thus also the spatial – scope of a SAFA includes the production of procured raw materials and inputs, if (a) the production and provision of these materials and inputs cause substantial sustainability impact (e.g. contribution to regional water scarcity) and (b) the extent of the sustainability impact can, via production, be influenced significantly by the buyer. The spheres of influence and impact should be determined through a rapid hot spot analysis prior to the actual SAFA. The decision tree of the GRI G3.1 Guidelines is recommended as a decision aid (GRI, 2011). Where risk management or due diligence procedures are in place, or an LCA or environmental impact assessment has been done, information on the physical scope may be derived from the respective documents.

Figure 1. Two examples of the scope of a SAFA in the value chain of a dairy product. Grey rectangles with bold writing symbolise actors whose operations are covered by a SAFA done by a dairy (left) and a retail company (right), respectively. Dashed rectangles represent actors outside the general scope of SAFA.

Time

The temporal scope of SAFA covers the most recent year for which all necessary information is available. For some indicators (e.g. greenhouse gas emissions, personnel fluctuation), multi-year trends should be assessed or sustainability impacts be allocated to a longer period.

Space

Spatial coverage extends to all production facilities and their surroundings, insofar as the assessed entities control or substantially affect the utilisation of these areas (GRI, 2011).

3.1.4 Principles of SAFA

Assessments based on the SAFA Guidelines are requested to comply with the following principles:

- The principles of the Bellagio STAMP[12] (Sustainability Assessment and Measurement Principles; IISD, 2009) should be applied to the greatest extent possible. For example, assessment methods based on the SAFA Guidelines have to be developed and applied in a transparent manner and based on a scientific approach.
- No person or entity must be forced to participate in a SAFA.
- The conduction of a SAFA must comply with legal provisions concerning the confidentiality of data collected for and generated through the assessment.

The methodological principles of SAFA are:

- Relevance. A SAFA-based assessment shall cover all relevant aspects of sustainability in such a manner that the obtained scores closely correlate with sustainability performance.
- Simplicity. To be applicable by anyone in the target group, including staff of small and medium enterprises and in developing and emerging countries, the Guidelines are kept simple through a consequent application of generic principles, referral to widely available information and concise and plain language. One guiding question in developing a SAFA-based sustainability assessment is "can this assessment be done and understood by staff of the concerned entities?"
- Cost efficiency. In order to leave a maximum of resources for the implementation of improvement measures, the cost of conducting a SAFA should be minimised e.g. by making the best use of existing data before collecting new information.
- Goal orientation. The guidelines and systems based thereupon define a vision, a long-term goal and indicator-specific goals and thus set a goal-oriented, generic framework. Contrary to means-oriented approaches (von Wirén-Lehr, 2001) the guidelines only provide examples of how the goals can be reached. Decisions on whether and how to valuate measures are to be taken prior to applying SAFA-based assessments, considering regional and enterprise-specific circumstances, and with a transparent justification.
- Performance orientation. With indicator sets based on the SAFA Guidelines, sustainability performance is assessed, i.e. the degree to which the operations of the assessed entity are in accordance with the stated sustainability goals.

12 www.iisd.org/pdf/2009/brochure_bellagiostamp.pdf

- Transparency. The disclosure of the system boundaries, indicators, threshold values, valuation functions, data sources and stakeholder relations is a mandatory part of every SAFA.

The implementation, development and maintenance of SAFA:

- Builds on existing standards. The importance and quality of existing systems for measuring, assessing, managing and communicating sustainability, social and/or environmental performance in the food and agriculture sector is fully acknowledged, many of their developers and users actually contributed to SAFA development. The SAFA methodology is partly rooted in the ISO 14040:2006 norm for Life Cycle Assessment (ISO, 2009), the ISEAL Code of Good Practice (version 1.0; ISEAL Alliance, 2010), the Bellaggio STAMP and the GRI Sustainability Reporting Guidelines (version 3.1; GRI, 2011). The generic indicator set owes much to an in-depth comparison of 43 standards and indicator sets.
- Adds value instead of duplication. The guidelines shall add to the value of existing sustainability, environmental and social management and auditing systems by rendering it easier to close thematic gaps. Implementing the guidelines should not impose an increased auditing load on producers.
- Takes place in an open and learning system. The guidelines are conceived as a system that is open in several regards. Due to their generic nature, SAFA-based evaluations must first be adapted to fit regional, sector-specific or company-specific conditions. Secondly, sustainability performance is considered to have no upper limit. Doing a SAFA-based assessment does not preclude the adoption of higher standards. Thirdly, the guidelines are developed and hosted by FAO, but are freely available to any interested party. Finally, the SAFA Guidelines are the result of an ongoing transparent development process, contributions to which are welcome from all that have a stake in the sustainable development of food and agriculture systems.

3.1.5 Sustainability dimensions and categories

All core categories in Table 2, split up into four sustainability dimensions, must be reflected in a SAFA, unless they are absolutely not applicable to the respective operations (e.g. soil is not relevant for fisheries). Non-applicability is to be explained in the SAFA report. The relevance of the sustainability dimensions is explained in the following. Category descriptions with relevant indicators, data needs and minimum requirements (category protocols) are provided in chapter 4.

Environmental integrity

To protect the integrity of Earth's ecosystems, a precondition for human existence, the use of natural resources and the environmental impacts of activities must be managed such that negative environmental impacts are minimised. This can be achieved by adopting an ecosystem approach. This approach, defined by the Convention on Biological Diversity (CBD), comprises twelve complementary and interlinked principles[13], and five operational guidances[14]. The CBD considers that a general application of the "ecosystem approach" will help achieve a balance of three objectives: conservation, sustainable use, and the fair and

13 www.cbd.int/ecosystem/principles.shtml

14 www.cbd.int/ecosystem/operational.shtml

equitable sharing of the benefits arising out of the utilisation of genetic resources. The need for an ecosystem approach applies to the whole food and agriculture sector, as well as to fisheries and forestry.

A variety of methods for quantifying, rating and managing environmental impact and resource use exists, including life cycle analysis (LCA) (ISO 14040ff.: 2009), ecological, water and carbon footprinting (e.g. Wackernagel & Rees, 1997), further methods specified in the ISO 14000 series of norms, and diverse methods for Environmental Impact Assessment. While some aspects of the environment, such as water quantity and quality and energy use, are quite well measurable, others, like soil fertility, biodiversity and animal welfare, defy simple, direct approaches for quantification.

Table 2. Sustainability dimensions and core sustainability categories of SAFA.

ENVIRONMENTAL INTEGRITY
Energy
Climate
Air
Water
Soil
Material cycles
Waste
Biodiversity
Animals

ECONOMIC RESILIENCE
Strategic management
Operating profit
Vulnerability
Local economy
Decent livelihood

SOCIAL WELLBEING
Human rights
Equity
Occupational health and safety
Capacity building
Food and nutrition security
Product quality

GOOD GOVERNANCE
Participation
Accountability
Rule of law
Fairness
Evaluation

Indicators on the use of natural resources as well as on emissions can be of two complementary types. They either refer to absolute quantities, such as litres of water withdrawn or Megajoules of energy used. The valuation of such quantities is difficult where no scientifically established carrying capacity or legal boundary exists which could be used as a minimum sustainability threshold. Energy use is an example for this: there is no single threshold for energy use per person, per area etc., beyond which development cannot be sustainable. In such situations, rating trends or comparing with benchmark values can be a resort. Such trend measures should be complemented by status measures. The other popular category of indicators are eco-efficiency or 'decoupling' measures, which relate environmental pressure (resource consumption or emissions) to the quantity or value of production (OECD, 2003; WBCSD, 2000). The downside of such indicators is that what ultimately counts from an ecosystem perspective is absolute pressure on the environment or absolute scarcity of a resource, both of which is not necessarily linked with eco-efficiency. For example, even a fruit grower whose orchards are highly water-efficient compared to others in the sector may deplete groundwater resources and thus not work sustainably. In a SAFA, the following aspects of environmental sustainability have to be addressed: energy, climate, water, soil, materials, waste, ecosystem health (including biodiversity and ecotoxicology) and (domestic) animals.

Economic resilience

Economic activity is the use of labour, land and capital to produce goods and services that meet peoples' needs (Jörissen et al., 1999). Thus, this dimension of sustainability is directly linked with the fulfilment of needs, a pillar of sustainable development as defined by the World Commission on Environment and Development (WCED, 1987). Even outstanding social, governance and environmental performances will as such not guarantee a firm's profitability and long-term existence, i.e. its sustainability *sensu strictu*. Moreover, sustainability in the social and environmental domains is supported by functioning businesses. It is therefore necessary to assess economic sustainability as a sustainability dimension in its own right. In a SAFA, this assessment focuses on the level of business economics. At this level, economic sustainability can be understood as an enterprise's ability to materially enable the stake- and shareholders taking part in its activities to live a decent, humane life, continuously and in the short and long run. In a wider sense, the company's ability to contribute to social and environmental sustainability may be added to this definition (Doane & MacGillivray, 2001).

At the absolute minimum, a company must be capable of (i) paying all its debts, (ii) generating a positive cash flow and (iii) adequately remunerating its staff and investors. To be considered economically sustainable, the company has to take precautions that ensure the maintenance of these capabilities in situations of economic, social and environmental (e.g. extreme weather conditions) turbulence. In brief, it must be economically resilient. Some aspects of economic sustainability have been controversially discussed. One of these is the question of "sustainable growth". Steady and adequate economic growth is a commonly used proxy for a positive socio-economic development. Economic growth is the declared goal of most political entities and was also endorsed e.g. by WCED (1987) and UNEP (2011). The possibility of endless economic growth in a limited ecosphere was contested and even termed an oxymoron e.g. by Daly (1990). Increasingly, the goal of decoupling economic growth from the use of limited natural resources is becoming popular (UNEP, 2011). The SAFA Guidelines forego the issue of growth rates necessary to sustain a business in favour of a 'bottom line' approach. This approach focuses on the stability of operations (expressed via vulnerability and solvency), the quality of management and the contributions made to the livelihoods of stakeholders and the functioning of local economies. Consequently, performance indicators such as return on assets and return on equity are not recommended for use in a SAFA – all the

more for agricultural enterprises, where equity is difficult to quantify. Gross margin and cash flow calculations are considered more useful in a SAFA context.

Social Well-being

The World Commission on Environment and Development, in its report 'Our common future', stated that "the satisfaction of human needs and aspirations is the major objective of development", and that „sustainable development requires meeting the basic needs of all and extending to all the opportunity to satisfy their aspirations for a better life" (WCED, 1987). Social sustainability thus is the fulfilment of basic human needs and the provision of the right and the freedom to satisfy one's aspirations; as long as this does not compromise the ability of others or of future generations to do the same. The social dimension of sustainability also pertains to human development, which according to UNDP (2011) is "the expansion of people's freedoms to live long, healthy and creative lives; to advance other goals they have reason to value; and to engage actively in shaping development equitably and sustainably on a shared planet". Basic human needs and rights are defined in the International Bill of Human Rights, which consists of the Universal Declaration of Human Rights (UN, 1948), the International Covenant on Civil and Political Rights (UN, 1966a) and the International Covenant on Economic, Social and Cultural Rights (UN, 1966b). They are further specified for work environments in the Declaration of Fundamental Principles and Rights at Work (ILO, 1998).

In SAFA, social sustainability is assessed in the business domain. Therefore, the contribution of business to the fulfilment of human needs is in the center of SAFA sustainability categories in the social domain. Guidance on how to protect and respect human rights in business operations is provided by the 'Protect, respect and remedy' framework, proposed by the Special Representative of the UN Secretary-General on the issue of human rights and transnational corporations and other business enterprises, John Ruggie, which was welcomed by stakeholders from the civil society, multilateral, business and industry domains (UN, 2011). According to the framework, the signatory states of the aforementioned treaties have the duty to guarantee protection from human rights violations. Business enterprises are responsible of respecting human rights, both in their own business activities and where human rights impacts are "directly linked to their operations, products and services by their business relationships" (UN, 2011).

Widely adopted normative documents, most prominently the OECD Guidelines for Multinational Enterprises (OECD, 2011), the UN Global Compact and the SA 8000 International Standard (SAI, 2008), are in line with the 'Protect, respect and remedy' framework and the ILO Declaration of Fundamental Principles and Rights at Work. The same applies to many standards that include sections related to human rights or social sustainability, such as the Codes of Conduct of the Business Social Compliance Initiative (BSCI, 2009) and the Common Code for the Coffee Community (4C Association, 2009), the Standards of Fairtrade International (Faitrade International, 2011a-d), the Sustainable Agriculture Standard (SAN, 2010a), and the compliance indicators of the Roundtable on Sustainable Biofuel (RSB, 2011), to cite just a few. Further standards, including the Basic Standards for Organic Production and Processing (IFOAM, 2005) and the Principles and Criteria for Forest Stewardship (FSC, 1996) refer to parts of the body of human and labour rights. In SAFA, social sustainability is broken down to the topics of human rights, equity, occupational health and safety, human resources development and *food security**. While an adequate standard of living, including food, as well as the equality of all human beings "in dignity and rights" are basic human rights (UN, 1948), it is suggested to treat these topics separately from human

rights in a SAFA. Reasons are the particular role of agriculture and fisheries in ensuring food security, and the particular challenges to equity in rural societies, which often are the starting point of value chains analysed with SAFA.

Good governance

Governance is 'the process of decision-making and the process(es) by which decisions are implemented' (UNESCAP, 2009). The concept of governance, which is most commonly applied in the political sphere, is built around notions such as transparency, participation, consensus orientation, accountability, responsivity, efficacy and the rule of law. Most aspects of governance are not readily quantifiable, and so this remains a largely qualitative concept. Yet for states, there are governance indicators that use scoring systems to convert qualitative judgements into quantitative measures. For example, the 'Index of Democracy' developed by the Economist Intelligence Unit[15] ranks countries by scoring them on a 0-10 scale across five governance categories, namely electoral process and pluralism, civil liberties, the functioning of government, political participation, and political culture. In SAFA, governance translates into corporate governance, which according to the OECD Principles of Good Corporate Governance is "a set of relationships between a company's management, its board, its shareholders and other stakeholders" and which furnishes "the structure through which the objectives of the company are set (...), the means for attaining those objectives and monitoring performance" (OECD, 2004).

Governance, being a cross-cutting issue in nature, is not always used as a separate dimension in sustainability assessment. However, many SAFA analyses will deal with a value chain and the governance concept is particularly apt for assessing relations between different stakeholders. The weight given to governance in the current Guidelines is in line with other business-centered approaches, such as that of the UN Principles for Responsible Investment (www.unpri.org) and the UN Global Compact (UNGC/IFC, 2009). Aspects of corporate governance that have to be covered in a SAFA include accountability (including due diligence and grievance procedures), fairness, evaluation (including transparency), participation and rule of law.

15 http://graphics.eiu.com/PDF/Democracy_Index_2010_web.pdf

3.2 How to implement a SAFA

To conduct a SAFA, the following phases must be run through (Fig. 2). While it is important to stick to the sequence as stated here because each phase builds the basis for the next, an iterative approach may prove necessary in many instances, e.g. when it becomes clear during data collection that system boundaries must be modified to better cover the company's sphere of influence. The visible output of a SAFA is the SAFA report comprising (a) a descriptive part and (b) an analysis part consisting of indicator tables and the calculation of scores per sustainability category.

Figure 2. Steps in a sustainability assessment following the SAFA Guidelines.

3.2.1 Step 1: Goal and scope definition

Statement of goals

The descriptive part of the SAFA report starts with a statement of goals. In analogy to the LCA methodology, the SAFA goals should unambiguously state the reasons for doing the assessment, the intended audience and use of the results (ISO 14040: 2009). The goals of the SAFA should be related to the assessed company's goals and, where possible, to each of the Bellagio STAMP principles. The length and concrete formulation of the goal statement are decided by the company conducting the SAFA.

Definition of system boundaries

The general SAFA scope has been delineated above (see section 3.1). The guiding principle for setting the system boundaries is the specific company`s sphere of influence, i.e. everything the company is able to influence or change[16]. For any particular SAFA, decisions on the following must be taken, justified and documented in the descriptive part of the SAFA report:

- Subject of the analysis. Key properties of the assessed system: organisation, location(s), dimensions, products, sector, position in the value chain.
- Material system boundaries. Which entities and processes are included in the assessment? What is the analysed company's sphere of influence? Which entities and processes are excluded from the assessment, and for what reasons? A flow diagram of all assessed processes should be drawn which indicates where processes were cut off.
- Spatial system boundaries. How far do substantial environmental, economic and social impacts occur beyond the land owned or directly used by the assessed entity? Which of these impacts are included in the SAFA?
- Temporal system boundaries. For what indicators does the assessment deviate from the one-year time frame? By how many years is the temporal scope extended for an indicator[17]?
- Rules for impact allocation. If environmental, economic and social impacts are inseparable between assessed and non-assessed processes, entities, locations and time periods, what proportions are attributed to each of them? Note that material, spatial

16 This implies that larger companies have a much larger sphere of influence than, for instance, a single farmer. Thus SAFA acknowledges the growing responsibility for sustainable production with growing company size

17 Example: Carbon sequestration in vegetation and soils may be calculated for the whole sequestration period, i.e. until a new equilibrium has been reached. This can take several decades.

and temporal system boundaries should be set such that allocation problems are minimised.

- *Critical review**. Will a critical review be undertaken? If yes, what type of review (e.g. internal or external)? What will be covered to what level of detail?

Definition and adaptation of calculation and valuation functions

Since the SAFA Guidelines are generic, they must be adapted to the concrete situation and needs of the company. This includes adaptations to particularities of the sustainability category, to regional and sectoral characteristics as well as to the type and situation of the company. The adaptation process must follow concrete guidelines to ensure that it does not attenuate nor alter the meaning of the SAFA. Aspects of SAFA that must be adapted include the following.

Sustainability categories: The coverage has to include all sustainability categories relevant in the given sector and region. For example, the 'Soil' category is irrelevant for enterprises whose business is purely based on catching fish, and the 'Animal' category does not apply to entities where no animals are kept. However, reasons for exclusion of sustainability categories need to be specified in the SAFA report.

Sustainability indicators and minimum requirements: Indicators to represent sustainability categories shall be chosen such that the sustainability goals for the category are addressed and that the company's performance can be properly evaluated. The company shall justify, if a sustainability category is not addressed by any indicator. The category protocols in chapter 4 include examples of indicators for all sustainability categories. Indicator selection and definition must take into account the state of knowledge on the sustainability category, as well as data availability.

The state of knowledge and the nature of some sustainability categories do not allow defining absolute minimum sustainability requirements for every indicator. This is only possible where either the *carrying capacity** of the considered resource is known and can be broken down to the company's sphere of influence, or where legal thresholds or widely accepted recommendations exist. Where none of this is available, company performance should not be substantially worse than the regional or sector average, or a transparently defined benchmark value (see below). A further approach is the definition of voluntary minimum threshold values by industry associations and other multistakeholder institutions.

Consequently, the hierarchy of indicator types in Table 3 has to be observed. Chosing an indicator from a lower category is appropriate only where no information is available for any higher category (e.g. no quantitative information on performance is available). In such cases, companies should strive to improve data availability and upgrade their indicators to a higher level as soon as possible

Table 3. Hierarchy of indicator types that can be used in a SAFA.

Type of indicator		**Example**			
1	Performance-based	Quantitative	Absolute	State	Total fossil fuel use in MJ in 2012
2	Performance-based	Quantitative	Benchmark[18]	State	Fossil fuel use in MJ per kg of milk solids, in % of the regional average in 2012
3	Performance-based	Qualititative	Absolute	State	Inacceptable forms of child labour in 2012? (nominal scale: yes or no)

[18] Comparison with a reference value, e.g. regional average, sector average or a defined situation, see below.

4	Performance-based	Qualitative	Benchmark	State	Sustainability dimensions covered by corporate policy in 2012, compared with the sector average
5	Measure-based[19]	Qualitative	Absolute	State	Water use efficiency in 2012, rating of irrigation technology
6	Measure-based	Qualitative	Benchmark	State	Water use efficiency in 2012, rating of irrigation technology in comparison with the regional average

Threshold values for sustainability rating: Threshold values facilitate the translation of the collected or calculated data (e.g. the company's GHG emissions) into a sustainability rating for each indicator. In SAFA, a discrete five-level rating scale visualised using an extended 'traffic light' colour code is employed (Table 4). The minimum sustainability requirements provided for each indicator in Chapter 4 mark the threshold separating insufficient from moderate sustainability performance for the respective indicator. The thresholds separating the higher levels can be selected by the company doing the SAFA. However, the employed classification should be compatible with the criteria stipulated in Table 4. Examples of classification thresholds are provided in Table 5.

Threshold values must be adapted to the conditions of the sector and region under consideration. The adaptation must be done in a transparent way, with sound justifications provided for each value chosen. Where the collected raw data are of a qualitative nature – such as ratings of worker satisfaction or of the conservation value of an ecosystem, or nominally scaled data –, rules for data transformation onto an interval scale must be defined and justified. In some instances, few or even no intermediate levels exist. For example, when checking for forced labour, there are only two clearly distinguishable cases – either it exists in the company or it does not. In the first case, the rating will be 'insufficient sustainability performance', in the latter case, it will be 'best sustainability practice'. To refine the scale, extraordinary activities to remove forced labour e.g. in supplier operations could be checked as well, but such extensions are not meaningful in all situations.

Table 4. Extended 'traffic light' scale for rating and visualising indicator scores in a SAFA.

Rating	Criteria
Best sustainability practice	The company by far exceeds the minimum sustainability requirement and/or the sectoral or regional average defined for this sustainability indicator. All economically and technically feasible measures to reach the sustainability goals for the category have been implemented, i.e. the company's performance is equal with the defined 'best practice' level.
Superior sustainability performance	The company performs substantially above the minimum sustainability requirement and/or the sectoral or regional average defined for this sustainability indicator. Most economically and technically feasible measures to reach the sustainability goals for the category have been implemented.
Fair sustainability performance	The company performs slightly above the minimum sustainability requirement and/or the sectoral or regional average defined for this sustainability indicator. Major improvement measures have been taken.
Moderate sustainability performance	The company fulfils only the minimum sustainability requirement and/or performance equals the sectoral or regional average for this sustainability indicator. Minor improvement measures have been taken.

[19] Qualitative rating of technologies or measures based e.g. on resource efficiency.

Insufficient sustainability performance	The company does not fulfil the minimum sustainability requirement and/or performance is worse than the sector or regional average defined for this sustainability indicator. No improvement measures have been taken.

Specification of average practice and best practice: In the SAFA context, benchmark values are a special type of threshold values. To determine the company's performance values for some indicators, comparative values have to be determined in order to specify whether the company conducting the SAFA is above or below average, or even works according to best practice. In order to determine the performance of the average comparable company, a company producing a similar portfolio of products in the same region is selected. If data from such a company is not available or no such company exists, specify a hypothetical company that works according to standard practice. Assumptions should be justified as far as possible and the basis of these assumptions available should be made in the SAFA report. The modelled performance of the similar company can be used as reference for comparison with own compagny performance.

Based on the model of the average company, one can also specify a comparable company which works according to best practice[20]. Again, assumptions must be justified as far as possible and the basis of these assumptions should be made available in the SAFA-Report. The modelled performance of this company can be used as a reference for comparison with own performance.

Finally, benchmark values can serve to separate insufficient from moderate sustainability performance for indicators, for which no absolute minimum sustainability requirement can be determined. It is recommended to use minimum requirements from existing evaluation schemes for this purpose, wherever possible (e.g. the absence of certain plant protection products from crop production is a requirement in several systems).

Table 5. Examples of classification thresholds for the SAFA rating of sustainability indicator results.

Rating	**Criteria per indicator and indicator type (see Table 3)**		
	Water use efficiency	**Wage level**	**Traceable products**
	5	**1 or 2**	**2**
Best sustainability practice	Best practice: irrigation, bath-room fixtures, tubes etc. opti-mised + regulation technique.	Lowest wages exceed regional average wage by more than 25%.	All products of the company can be traced to primary production without gap.
Superior sustainability performance	Nearly all feasible measures: drip irrigation in all easily accessible areas.	Lowest wages are above regional average wage.	Share of products which can be traced to primary production exceeds defined average.
Fair sustainability performance	Major measures: investment into sprinkler irrigation in part of the production area.	Lowest wages are equal to regional average wage.	Share of products which can be traced to primary production equals defined average.
Moderate sustainability performance	Minor measures: posters to increase awareness, water-saving tabs and toilets.	Lowest wages are equal to regional living wage.	Share of products which can be traced to processor equals defined average.
Insufficient sustainability performance	No measures to save water.	Lowest wages are below the regional living wage.	No product can be traced.

[20] Existing ratings may be used, e.g. the "SAM Sector Leaders": www.sam-group.com/de/sustainability-insight/the-sustainability-yearbook.jsp

The transparent documentation of SAFA configuration, including information on regional and sector adaptation, is an integral part of the assessment process (see section 3.6.8 and Annex A) and of the SAFA report. At the end of this phase, a complete set of indicator descriptions with corresponding threshold and ideal values must be documented as a basis for the next SAFA phase.

3.2.2 Step 2: Data collection

After having adapted the SAFA indicators to the concrete situation of the company, data for the assessment must be collected. The following rules hold for the data collection phase:

- Use the most precise and reliable data available;
- Data should have been collected using standardised measurement methods (IISD, 2009);
- The use of already present data collected or calculated in the context of environmental and social certification, management and analyses is recommended. Thus, the collection of data that explicitly serves a SAFA can be reduced to the closing of information gaps on which data have not yet been gathered.

Data collection can take different forms, e.g. an audit including a farm or factory visit. The form of data collection must be documented, and its representativeness of the companies`work routines shall be justified.

3.2.3 Step 3: Data analysis and calculation

A SAFA results in one sustainability rating per sustainability indicator. To obtain ratings, the collected or calculated raw data must be normalised to a scale according to the threshold values and valuation functions defined during the first SAFA phase (see section 3.2.1).
Calculation is done individually for each of the defined indicators. The following principles always apply:

- The calculation process must be transparent, with all functions presented;
- Data insufficiencies can sometimes require the estimation of certain values. In order to ensure transparency, data quality must be indicated for all quantitative values used;
- Decisions on rules for aggregation and weighting of indicators must be justified and described;
- Calculation rules should be in line with standards already applied in the respective sector.

3.2.4 Step 4: Interpretation

In this step, the performance ratings achieved by the company are interpreted with respect to a) validity (inaccurancies due to lack of data or assessment methods) b) context and c) scope and priorities for action.

3.2.5 Step 5: Reporting

All documentation notes from the different SAFA steps are combined into the SAFA report. This report is the visible output of a SAFA. The following principles (partly based on Bellagio STAMP) apply to reporting:

- The structure of the report shall follow the structure of the SAFA process steps;
- The report consists of a descriptive and an analytical part;
- The report should be written in clear and concise language;

- All information is presented in a fair and objective way (both positive and negative results);
- Where applicable, innovative visual tools and graphics which aid understanding and interpretation shall be used;
- Data should be made available in as much detail as practically feasible.

Aggregation and visualisation

The communication of SAFA results, be it internally, B2B or B2C, will in many cases require an aggregation of the obtained scores. Aggregation can be done for indicators within a sustainability category, for sustainability categories for a company, and for multiple companies along the value chain. A variety of aggregation approaches can be employed, depending on the purpose and target audience of the respective SAFA. For example, internal sustainability management may require a hot spot analysis. In this case, aggregation may consist in the identification of the sustainability category for which the worst score was obtained, hence where there is the greatest need for action. Other options include the calculation of the mean or the median of all sustainability category scores, or of the scores within each sustainability dimension. All types of aggregation have in common that a gain in communicability is accompanied by a loss of information and a risk of relevant informations' being masked.

Appropriate visualisation techniques can partly overcome the trade-off between the communicability and the completeness of information. Two examples of illustrations of overall sustainability performance and sustainability gaps are provided in Fig. 4 and 5.

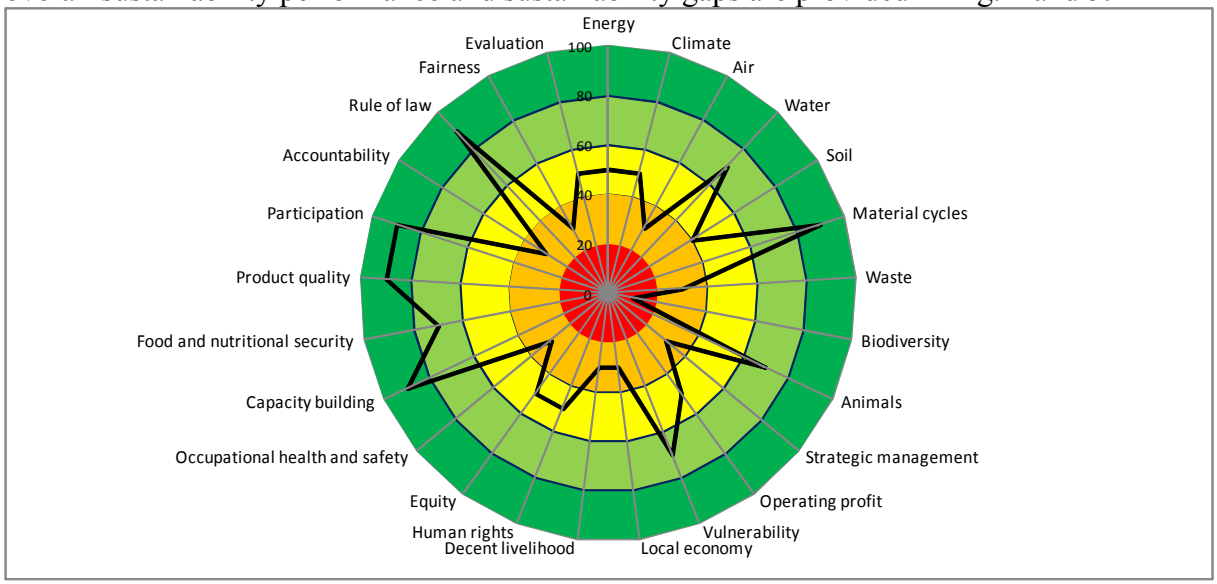

Figure 4. Visualisation of the SAFA category scores of a company by a 'sustainability polygon'. For colour meanings, see Tab. 4. The thick black line connects the category scores, each of which can be the aggregate of several indicator scores.

Figure 5. Visualisation of the SAFA category scores (using three categories as examples) of multiple actors along a value chain by 'sustainability chains' or 'sustainability quipus'. For colour meanings, see Tab. 4. This type of illustration can support hot spot analyses at value chain level.

Critical review

A critical review, either by the assessing or assessed organisation or externally, is an essential part of SAFA. It fosters the quality, credibility and transparency of an assessment. This is in

line with the procedure outlines of LCA (ISO 14040, 2009) and the G3.1 Guidelines (GRI, 2011a), as well as the transparency principles of the Bellagio STAMP (IISD, 2009) and the ISEAL Impacts Code (ISEAL Alliance, 2010).

In a SAFA, the critical review may be handled in different ways. The disclosure of procedure (see next section) should provide all information needed for a critical appraisal by interested stakeholders and consumers. In addition, a rigorous internal or external review can be undertaken. Where results are designated for B2B or B2C communication, an external review is imperative. The type, comprehensiveness and complexity of this review, as well as the involved persons, are defined during the SAFA scoping phase. Whether and how the review results are made available to the public is decided by the commissioning entity.

Disclosure of procedure

Companies undertaking a SAFA should have the possibility of benefiting from the experiences of others and of striving for the best sustainability performance and the strictest sustainability thresholds. In line with the transparency principle of the Bellagio STAMP[21] (IISD, 2009), the public, too, should have access to information that helps critical consumers understand how the SAFA of a company was done.

Therefore, information on the selected system boundaries, indicators, threshold values, valuation functions, regional and sectoral adaptations and data sources, inclusion of data from other audits, assumptions and uncertainties and about stakeholder relations in each SAFA process should be made publicly accessible. This will allow companies operating in the same region and/or industry sector to use previously used SAFA "configurations" for orientation. The concept is analogous to the Product Category Rules (PCR) used in environmental impact assessment (ISO 14025: 2006). Since sustainability is often considered a pre-competitive issue by the private sector (SustainAbility, 2011), as testified by the cooperation of numerous companies in the frame of multistakeholder initiatives (e.g. the 'New Vision for Agriculture'; WEF, 2010), mutual access to SAFA-related information should not pose a problem. Public access is desirable as this would contribute to the credibility and societal value of SAFA. Hence, a mutually and potentially even publicly accessible clearing house for SAFA-related information is needed.

SAFA-related information can be uploaded to a publicly accessible database, maintained e.g. by FAO together with other partner institutions. Annex A provides an orientation on how SAFA descriptions in this database could be structured and what they should contain. A system for quality control of the uploaded data would eventually be required.

21 www.iisd.org/pdf/2009/brochure_bellagiostamp.pdf

4. Sustainability category protocols

The following sections describe the SAFA sustainability categories, classified into four dimensions of sustainability. The sustainability category protocols (Table 6) form the core elements of a SAFA throughout the SAFA phases. Each sustainability category protocol specifies a set of suitable indicators to measure the degree of sustainability for the respective category. Due to the large differences between supply chains within the agricultural sector, these indicators must allow for adaptation to regional and sector specific conditions, a key process of a SAFA (see Chapter 3). For each category and its associated indicators, information is drawn from a wide range of standards and scientific literature.

Table 6. Outline of SAFA sustainability category protocols.

1. Relevance of the sustainability category
Rationale for including the category: acknowledged relation with sustainable development, important challenges, relation with food and agriculture systems, important standards and agreements.
2. Sustainability Goals
Translation of societal and higher-level goals to the company level.
3. Indicators and data needs
Tabular overview of indicators appropriate for measuring performance in relation to the goals: indicator name and description, data needs, minimum sustainability requirements (threshold separating insufficient from moderate sustainability performance).
4. Examples of measures to improve sustainability
Examples of measures in the food and agriculture domains with a proven potential to enhance sustainability performance in relation with the respective category.
5. Definitions
Definitions of specific terms related to this sustainability category.
6. Sources of further information
Links to documents and data sources containing further relevant and useful information.

4.1 Energy (E1)

Relevance of the subject

Every economic activity involves the use of energy in one of its many forms. "Energy is central to sustainable development and poverty reduction efforts"[22]. Thanks to their high energy density per unit weight and per unit cost, fossil energy carriers – primarily coal, oil and natural gas – have fueled economic progress since the industrial revolution. Their use facilitated the decoupling of energy use, and consequently of industrial production and economic growth, from land use.

By 2008, statistically recorded global per capita energy use had reached 76.4 GJ per year (IEA, 2009), excluding traditional biomass such as firewood. This figure is projected to continue rising for decades. While demand for oil is predicted to rise faster than supply in the near future, foreseeable bottlenecks for natural gas and coal will not concern geological availability (BGR, 2006) but rather higher prices due to scarcity and more importantly, the capacity of the atmosphere to serve as a sink for CO_2 released from burning these fuels without catastrophic climate change (see section 4.2). Dependency on non-renewable energy carriers, as well as the observable impacts on the environment let many of the current energy systems appear unsustainable.

Challenges to sustainable energy use include limitations that are geological (limited stocks of fossil fuels), biological (limited productivity of vegetation), economic (cost of renewables) and social (limited acceptance of renewables) in nature. For a sustainable energy future, "a global revolution in the way that energy is supplied and used" is required, centered on the twin pillars of efficient and clean energy technologies (OECD/IEA, 2008). Both pillars are internationally accepted and feature prominently in national targets, e.g. the 12th five-year plan of the People's Republic of China.

The primary sector has much to contribute to both pillars. Energy efficiency can be raised by optimising energy-intensive processes such as heating and cooling of buildings and of produce, ventilation of barns, active drying of fodder and produce, tillage, synthetic fertilizer use, mechanization and irrigation. Primary producers can be providers of energy in the forms of biogas, firewood, biofuels, solar energy (electricity or heat), as well as wind and water power.

Sustainability goals

(1) The best available technology is used to optimise energy efficiency.

(2) The energy supply of operations is entirely based on renewable, environmentally unproblematic energy sources and carriers.

Indicators and data needs

Goal	Indicator name	Description	Data needs	Minimum requirements
1	**Energy efficiency (quantitative)**	Amount of energy used (in MJ) per unit product, turnover, revenue, profit, area or workforce. Rate by comparison with benchmark[23] values.	Quantities of all energy carriers directly used in operations, in litres, m^3, kWh etc. Energy densities of all energy carriers used, to facilitate conversion into a common unit (preferrably an SI unit, e.g. J). Quantities of the respective	The energy efficiency of operations is equal to the regional sector benchmark.

22 Cited from: www.undp.org/energy.

23 See glossary for the meaning of the term ‚benchmark' in SAFA.

			reference unit. Energy imports and exports, e.g. energy use in contractual work (energy used by others, but within the analysed production site; energy used by the analysed entity, but outside the production site).	
1	**Energy efficiency (qualitative)**	Rating of the energy efficiency of technologies used in operations and of patterns of energy use	Overview of technologies used (including isolation) and of patterns of energy use, e.g. modal split of freight transport. Reference data on the energy efficiency of technologies.	All technically and economically feasible measures to enhance energy efficiency are implemented.
1	**Energy saving**	Amount of energy saved through enhanced efficiency	Total energy use in operations, before and after implementation of improvement measures. Attribution of savings to measures.	Energy use is reduced through effective measures.
1	**Indirect energy use**	Indirect energy use caused by operations, for inputs on the one hand and capital goods (buildings, machines and infrastructure) on the other	Overview of inputs and capital goods. Reference data on the "grey" energy used to provide inputs and capital goods.	Grey energy use is equal to the regional sector benchmark.
2	**Share of sustainable energy supply**	Structure of energy supply, origin and sustainability of the used energy sources	Quantities of all energy carriers directly used in operations, in litres, m^3, kWh etc. Energy densities of all energy carriers used, to facilitate conversion into a common unit (preferrably an SI unit, e.g. J). Information on the origin of the used energy carriers. Do they originate from renewable and sustainable sources?	The share of sustainable energy carriers in total energy use is equal to the benchmark.

Examples of measures to improve sustainability

- Mainstream principles of sustainable energy use into strategies and operations.
- Monitor used energy quantities and the structure of energy supply, if possible at process level.
- Assess risks, opportunities and impacts associated with energy use.
- Establish an energy management, energy use and efficiency, or energy reduction plan.
- Inform staff and stakeholders about ways to save energy, encourage suggestions from staff.
- Abolish energy-intensive processes or replace them by less intensive alternatives. Examples: no more air freight, shorter transport distances, reduced tillage, better isolation of buildings, more energy-efficient inputs, machinery and procedures. Take care not to simply outsource energy use e.g. to suppliers.
- Invest in saving energy through better isolation of buildings, reducing unnecessary energy use (e.g. lighting of rooms when noone is present, overheating and overcooling), optimising processes etc.
- Invest in renewable energy supply.

Definitions

Energy carriers: electricity, coal, biomass, fossil oil and gas, hydrogen.

Energy efficiency: ratio of services delivered and the energy input required to deliver these services.
Grey energy: energy used outside an entity to produce inputs, build machinery and construct buildings required for the assessed entity's operations.
Renewable energy: energy derived from natural processes, such as sunlight and wind, replenished at a higher rate than they are consumed; for example solar, wind, geothermal, hydro, and biomass[24].

Sources of information

- Energy terms, statistics and policy: International Energy Agency (www.iea.org)
- World Energy Council: www.worldenergy.org
- UNDP website on Environment and Energy: www.undp.org/energy
- UN-Energy knowledge network of the United Nations' inter-agency mechanism on energy: www.un-energy.org
- Global Bio-Energy Partnership (GBEP): www.globalbioenergy.org
- Agricultural energy assessment:
  - PLANETE (INRA, France) (www.solagro.org/site/im_user/286014planeteooct02.pdf)
  - Fieldprint calculator (www.fieldtomarket.org/fieldprint-calculator/info)

24 International Energy Agency Glossary of terms: www.iea.org/glossary/glossary_R.asp

4.2 Climate (E2)

Relevance of the subject

Global warming refers to the rising average temperature at global level. During the last 100 years the global average temperature rose by about 0.8°C, while most of the increase took place in the course the last decade. This increase is expected to fasten, leading to a projected global warming of 1.1 to 6.4°C during the 21st century (IPCC, 2007). Weather and climate conditions within the ecological tolerance of the regional flora and fauna are a precondition for the productivity and stability of marine, agricultural and forest ecosystems. As these conditions are likely to drastically change and the risk of catastrophic whether events will increase, drastic environmental, social and economic consequences are expected. Scientific evidence strongly suggests that the emission of greenhouse gases (GHG), mostly CO2, CH4 and N2O, is a major cause of the observed global warming (IPCC, 2007).

The food sector is a major contributor to climate change. About 20-30% of GHG-emissions can be associated with food consumption, while the primary sector is responsible for about 10 – 15 % of global greenhouse gas emissions (EC 2010). Driving factors are methane emissions from livestock, nitrous oxide and carbon dioxide released from arable fields, carbon dioxide emissions from burning fossil fuels in primary production and, most importantly, from land use cover change (primarily by the conversion of forests into agricultural areas. Yet, agriculture is not only affecting climate change, but also affected by it, as changes in temperature and rainfall patterns and dramatic wheter events will drastically impair agricultural activities, particular in regions where people are already vulnerable to food insecurity.

Sustainability goals

Sustainable food production needs to take into account both mitigation and adaptation options as far as possible and should aim for:

1) Operations do not contribute to adverse climatic impacts.
2) Operations contribute to climate change mitigation through Carbon sequestration.

Indicators and data needs

Goal	Indicator name	Description	Data needs	Minimum requirements
1, 2	**GHG emissions**	Net GHG emissions from cradle-to-gate, within sphere of influence. Measured in $CO_{2\text{-eq}}$ per unit product	Quantify GHG emissions from cradle-to-gate (within sphere of influence) using LCA or carbon footprinting based on PAS2050 or the GHG Protocol. Offsetting via CDM may be taken into account if Gold Standard is fulfilled.	Not yet determined
1	**GHG intensity**	GHG emissions per unit product, compared with benchmark	GHG emissions have to be calculated for the company and for a hypothetical comparable average company from the same region and sector for comparison.	GHG intensity equals the sector benchmark
1	**GHG reduction measures**	Qualitative indicator of means for reducing GHG emissions along the supply	List economically and technically feasible measures for reducing GHG emissions within the sphere of influence	Minor reduction measures have been taken

		chain	and the state of implementation	

Examples of measures to improve sustainability

- Reduce GHG emissions by (1) burning less fossile fuels and biomass – normally achieved through measures to save energy and switch to renewable energy supply, (2) reducing methane emissions from enteric fermentation by optimising ruminant feeding, (3) reducing nitrous oxide emissions by optimising paddy rice irrigation as well as the nitrogen fertilisation of all crops.
- Enhance carbon sequestration and storage through afforestation, fostering soil organic matter buildup and measures to increase the biological productivity of production systems (diverse crop rotation, appropriate fertilisation, irrigation, improved seeds etc.).

Definitions

Greenhouse Gases: long-lived greenhouse gases (GHG) whose emissions are covered by the UNFCCC[25] *include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and halocarbons (IPCC, 2007).*

Carbon dixide equivalent: emissions of greenhouse gases are typically expressed in a commonmetric, so that their impacts can be directly compared, as some gases aremore potent (have a higher global warming potential or GWP) thanothers. The international standard practice is to express greenhouse gases incarbon dioxide (CO_2) equivalents. Emissions of gases other than CO_2 are translated into CO_2 equivalents using global warming potentials (EPA, 2005). Global warming potentials (in relation to carbon dioxide) of typical greenhouse gases are 25 for CH_4, and 298 for N_2O (IPCC, 2006).

Carbon sequestration: immobilise carbon from the atmosphere by storing it in longterm pools so that no immediate re-emission can occur.

CDM: Clean Development Mechanism[26]

Gold Standard: a label that high-quality carbon offset projects[27].

Sources of information

- United Nations Framework Convention on Climate Change: www.unfccc.int
- Intergovernmental Panel on Climate Change: www.ipcc.ch
- FAO EX-ACT tool (www.fao.org/tc/tcs/exact/en)
- Cool Farm Tool (www.growingforthefuture.com/cms/pages/documents/TheCoolFarmTool_v1.0.xls)
- Holos (Agriculture & Agri-Food Canada) (www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1226606460726&lang=eng)
- CALM (Country Land & Business Association) (www.calm.cla.org.uk/)
- PAS 2050
- Greenhouse Gas Protocol

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25 United Nations Framework Convention on Climate Change

26 http://cdm.unfccc.int

27 www.cdmgoldstandard.org

1 • ISO 14065: 2007

4.3 Air (E3)

Relevance of the subject

Energy supply, motor transport, cooking, agriculture, industrial production, burning of biomass for land conversion and other human activities all can cause air pollution. The most important air pollutants are particulate matter, (stratospheric) ozone-depleting substances, chemicals causing the formation of tropospheric ozone, sulphur dioxide, carbon monoxide, nitrous oxides and ammonia.

The adverse effects of these pollutants impair both human health and the integrity of ecosystems and their functions. The WHO attributes more than 2 million premature deaths per year to air pollution with particulate matter alone, a figure that is steeply rising, particularly among the urban populations of emerging and developing countries. The cost of health damage due to air pollution, predominantly by particulate matter, was estimated at 3.8% of the 2005 GDP in China and 0.7 to 2.8% of GDP in the USA (UNEP, 2011). To these figures, health and ecosystem damage due to other air pollutants and combined exposure to several pollutants add. In Europe, the energy sector contributes 30% to particulate matter emissions, followed by road transport (22%), manufacturing (17%) and agriculture (12%) (Krzyzanowski et al., 2005). Agriculture is the main source of volatile ammonia emissions, which cause eutrophication in natural ecosystems, of nitrous oxide (see section 4.2) and, not least, of odours. On the other hand, agricultural and forestry production are among the most exposed sectors concerning immissions of acidifying and eutrophicating substances as well as of ozone, which can impair plant growth.

Being a particularly visible type of environment pollution, air pollution has since long been the subject of national legislation. One widely implemented approach to tackle the problem of attributing responsibility for damage caused by air pollution is the 'polluter pays' principle. International agreements on the issue include the Convention on Long-Range Transboundary Air Pollution and its various Protocols, the Rotterdam Convention on the Prior Informed Consent Procedure and the Montreal Protocol on substances that deplete the ozone layer. Major success stories are linked with the fight against air pollution: the Montreal protocol lead to reductions in the consumption of ozone-depleting substances by 95% in industrialised and by 72% in developing countries until 2006[28]. Tetraethyllead, which has neurotoxic effects and damages catalytic converters, was or is phased out in all but six countries. The nature and extent of the damage linked with the provision of a product or service can vary strongly depending on the inputs and technologies used. For example, the adaptation of improved exhaust gas filters in factories as well as the ban of leaded fuel and the reduction of sulfur content in fuels have contributed to major improvements of air quality in Europe and other regions of the world. The definition and monitoring of interim targets and maximum allowable concentrations of health-damaging air pollutants (e.g. WHO, 2006) e.g. at production sites has contributed to better health of employees. A general principle for handling pollution risks implemented in many national laws is to prevent pollution in the first place. Pollution control is the second-best option, followed by the remedy of environmental and health damage.

28 http://ozone.unep.org/Publications/MP_A_Success_in_the_making-E.pdf

Sustainability goals

(1) Emissions of ozone-depleting substances, ammonia, NO_x, SO_x, particles, ground-level ozone, biological pollutants and other air pollutants are kept at or reduced below levels detrimental to the health of ecosystems, plants and animals, and humans.

Indicators and data needs

Goal	Indicator name	Description	Data needs	Minimum requirements
1	**Emissions of air pollutants**	Total emissions of ammonia, CO, NO_x, SO_x, photochemical oxidants, particulate matter, pesticides, microorganisms, ozone-depleting substances	Tons of NH_3, SO_4 equivalent, CFC-11 equivalent, particulate matter etc.	Not yet determined.
1	**Emission intensity**	Emissions per unit output	Tons of NH_3, SO_4 equivalent, CFC-11 equivalent, particulate matter etc. Output in units weight, volume, value etc.	Emissions of air pollutants per unit output are equal to the benchmark.
1	**Pollutant concentration**	Concentrations of relevant pollutants (see above) in exhaust gases or close to production facilities	Pollutant concentrations measured at different times, e.g. in ppm	Pollutant concentrations do not exceed legal maximum thresholds or accepted recommendations[29].
1	**CFC recovery rate**	CFC recovered in % of total CFC release	Amount of CFC released Amount of CFC recovered	CFC recovery rate is equal to the sector benchmark.
1	**Catalytic converters + particle filters**	Percentage of vehicle (including farm machinery) fleet equipped with catalytic converters resp. particle filters (Diesel only)	Total number of cars Number of cars equipped with functioning catalytic converters, particle filters, selective catalytic reduction etc.	The percentage of cars equipped with catalytic converters is equal to the benchmark.
1	**Ammonia emissions**	Total emissions of ammonia from farm activities	Risk assessment or model calculation based on fertiliser, livestock and manure management (storage, application, housing)	Ammonia emissions do not exceed the benchmark.

Examples of measures to improve sustainability

Definitions

CFC-11 equivalent: unit for the relative ozone depletion potential of different substances (GRI, 2011).

Ozone-depleting substances: „controlled substances" according to the annexes to the Montreal Protocol, i.e. Chlorofluorocarbons (CFCs) and Hydrochlorofluorocarbons (HCFCs).

Sources of information

- Global air pollution map of the European Space Agency: www.esa.int/esaEO/SEM340NKPZD_index_0.html (a NASA map exists as well)
- AirNow map of air quality in the U.S.: www.airnow.gov

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[29] For example, the green level of the Air Quality Index of Oregon (www.deq.state.or.us/aqi/index.aspx)

- Agrammon tool of the Swiss College of Agriculture for calculating farm ammonia emissions: agrammon.ch/about-agrammon (for temperate climate)

- WHO guidelines for indoor air quality: www.euro.who.int/__data/assets/pdf_file/0009/128169/e94535.pdf

- WHO Air Quality Guidelines: www.who.int/phe/health_topics/outdoorair_aqg/en/

4.4 Water (E4)

Relevance of the subject

Water quantity

Access to sufficient volumes of clean freshwater is indispensable for human life and development, and for agricultural and forest ecosystems (GWP, 2000). Domestic, industrial and energy-related water demand is growing rapidly. More than 900 million people today live in watersheds with physical water scarcity, a figure expected to increase by 700 million people in the near future (IWMI, 2006). Low to medium income countries with high rates of population growth are particularly affected by environmental stress and socio-economic tension resulting from water supply being outstripped by demand (FAO, 2011).

Of the 4'500 km^3 per year of freshwater that are withdrawn from aquifers, streams and lakes, 70% are used by agriculture. Irrigated land disproportionately contributes to food security in many of the world's most densely populated regions, particularly in Asia. Worldwide, irrigated area has increased by 117% from 1961 until 2009. A further increase of irrigated area, from 301 million hectares in 2009 to 318 million hectares in 2050 has been projected (FAO, 2011). Virtually all of Africa, North China South and West Asia are expected to be incapable of achieving food self sufficiency due to water scarcity by 2025 (Falkenmark (1997).

With growing and contesting water demands, and agricultural uses being comparatively low-profit, water availability to agriculture is a growing constraint, especially in areas with a high intensity of water use and/or inadequate management of water resources (FAO, 2011).

Water quality

An appropriate quality of water used for drinking and other domestic purposes, irrigation or industrial production is as important as sufficient water quantities. Eutrophication and pollution of freshwater with heavy metals, toxic xenobiotics, pathogens (including fecal germs) and other substances are common threats to the health of humans, livestock and ecosystems. For example, drinking water polluted with pathogens is an important source of infectious diseases that claim some 6'000 human lives a day (UNESCO, 2003). Irrigation e.g. of vegetables with insufficiently treated wastewater is one of the causes of infections by intestinal worms and bacteria, and of diarrhea (Blumenthal & Peasey, 2002).

Agriculture is the most important non-point polluter of water, followed by industry and households. Inappropriate agricultural water use is causing secondary soil salinisation on large tracts of land in the Middle East and Central Asia and thus contributes to land degradation in areas already affected by land and water scarcity (FAO, 2011).

Sustainability goals

Society goals

There is rising public and political awareness with regard to the need for a sustainable use of water resources, with regard to both quality and quantity. Agenda 21, Chapter 18 contains the aim of safeguarding an appropriate supply of good quality water for the entire population of the planet while maintaining the hydrological, biological and chemical functions of the ecosystems (UN, 1992). The Millennium Development Goal 7, 'Ensure environmental sustainability', includes target 7.C, 'halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation'[30]. The World Health

30 www.mdgmonitor.org/goal7.cfm

Organization (WHO) has issued comprehensive guidelines for drinking water quality, as well as for the safe use of wastewater, excreta and greywater[31].

Company goals

(1) Freshwater withdrawal for operations does not raise physical water scarcity to levels dangerous for the functioning of ecosystems, communities and economy in the watershed.

(2) Operations cause no pollution of water beyond levels that would threaten the functioning of aquatic ecosystems or human health.

Indicators and data needs

Goal	Indicator name	Description	Data needs	Minimum requirements
1	**Water withdrawal**	Annual water extraction (in m^3)	Quantify water extraction amounts from all sources used (tap water, rivers, wells, etc.). Identify sources of tap water	Water withdrawal from surface and groundwater is monitored and minimised.
1	**Water stress**	Water use and recharge rates (both in m^3, or as ratio of both) or proportion of total water resources used Frequencies of water shortages and water-related dispute Incidence of disturbances and disruptions of production due to lack of water	Identify level of water stress of all water sources used by means of monitoring of groundwater tables/river flow levels; document any water shortages and water - related dispute events	No contribution to critical regional level of water stress.
1	**Water use practices**	Irrigation technologies, timing and amounts Water use intensity, based on processes and technologies (in m^3, can be put in relation with local water availability) Water reuse and recycling (in m^3 or in % of total water or wastewater volume)	Identify exact amounts needed for each process / machine involved in operations Identify water reuse amounts and relate to total water use	Minor measures taken to enhance water recycling and reduce freshwater use.
1	**Water use efficiency**	Calculate water use efficiency by relating absolute water use with product quantity	Water use in m^3 per unit product (comparison with benchmark)	Water use efficiency is equal to the regional sector benchmark.

31 www.who.int/water_sanitation_health/publications/2011/dwq_guidelines/en/index.html

2	**Water and wastewater quality**	Monitoring of water quality parameters and comparison with legal thresholds or widely accepted recommendations	Concentrations of nitrate, orthophosphate, salts, faecal coliforms, BOD, COD (in ppm, dS/m, l of O_2 per l of water etc.) Water quality bio-assay	No legal or widely accepted limits are exceeded.
2	**Nutrient/ pollutant storage and application**	Safety of storage facilities, proximity of storage facilities of water courses, precision and efficiency of application technology, timing and conditions during application => probability of leaching)	Rate the mentioned factors according to a suitable and transparent scale	Regular monitoring and improvement of storage facilities and application techniques
2	**Quality of (waste-) water at point of discharge**	Amount of water pollution by plastics, oil etc. Frequency and intensity of spills) Irrigation water (salinity, turbidity, faecal coliform load) Wastewater treatment procedures	Regular laboratory measurements of water quality parameters of all waters at point of withdrawal and at point of discharge, including irrigation water Calcuation of water pollution per m^3 from the two figures Qualitative description of wastewater treatment measures	No ecosystem-threatening spills. No legal or widely accepted limits are exceeded. Minor measures taken to improve wastewater treatment.

Examples of measures to improve sustainability

- Repairing and upgrading of irrigation systems. "Most irrigation systems across the world perform below their capacity and are not adapted to the needs of today's agriculture" (FAO, 2011).
- Water collection by "rainwater harvesting" and flash-flood irrigation
- Water storage in low-cost cisterns
- Various variants of efficient drip and sprinkler irrigation, in combination with water monitoring and regulation technologies
- Deficit irrigation and alternate furrow irrigation.
- Recycling of treated wastewater (e.g. constructed wetlands, gravel filters) using appropriate wastewater irrigation ("right quality to the right crop").
- Breeding of more water efficient crop cultivars
- Multiple use of water in aquaculture, animal production and small enterprises to increase economic water productivity
- Safe storage of manure, slurry and silage
- Buffer zones to surface waters and surface-near groundwaters
- Appropriate (waste-)water treatment and purification

Definitions

Biochemical Oxygen Demand (BOD): amount of oxygen consumed by microorganisms in breaking down organic substances dissolved in water; expressed in mg O_2/l water. BOD is positively correlated with the rate of oxygen depletion in water bodies.

Chemical Oxygen Demand (COD): an indirect measure of the amount of organic substances contained in water; expressed in mg O_2/l water and determined using a strong oxidising agent.
Eutrophication: overloading of surface or ground water with nutrients, in particular N and P.
Total water withdrawal: „the sum of all water drawn into the boundaries of the reporting organization from all sources (incl. surface water, ground water, rainwater and municipal water supply) for any use over the course of the reporting period" (GRI, 2011).
Wastewater recycling: processing wastewater through another cycle before discharge to final treatment or discharge to the environment (GRI, 2011).

Sources of information

- International Water Management Institute (IWMI) : www.iwmi.cgiar.org
- FAO Aquastat: www.fao.org/nr/water/aquastat/main/index.stm
- FAO CropWat 8.0: www.fao.org/nr/water/infores_databases_cropwat.html
- FAO Natural Resources Management and Environment Department, Water page: www.fao.org/nr/water/index.html
- UN Water statistics: www.unwater.org/statistics.html
- Global map of irrigation areas: www.fao.org/nr/water/aquastat/irrigationmap/index.stm
- WBCSD Global Water Tool: www.wbcsd.org/web/watertool.htm
- Google Earth Layer showing the water stress index by Pfister et al. (2010): www.ifu.ethz.ch/staff/stpfiste/WSI_point.kmz
- Earthtrends database of the World Resources Institute: earthtrends.wri.org/searchable_db/index.php?theme=2
- Water Footprint Network: www.waterfootprint.org
- WOCAT database (World Overview of Conservation Approaches and Technologies): www.wocat.net

- Dublin Statement on Water and Sustainable Development (Principles for sustainable use of water resources): www.wmo.ch/pages/prog/hwrp/documents/english/icwedece.html the[32].
- Water, sanitation and health databases and statistics of the WHO: www.who.int/water_sanitation_health/database/en
- International Water Management Institute (IWMI): www.iwmi.cgiar.org
- International Water Association: www.iwahq.org/1nb/home.html
- FAO paper on "Wastewater treatment and use in agriculture": www.fao.org/docrep/t0551e/t0551e00.htm#Contents
- GIZ website on Sustainable Sanitation (EcoSan): www.gtz.de/en/themen/8524.htm

32 www.wmo.ch/pages/prog/hwrp/documents/english/icwedece.html

4.5 Soil (E5)

Relevance of the subject

Fertile soils are the basis of virtually all life on the continents and of human livelihoods. Humans use them to grow food and fodder crops, renewable raw materials and energy carriers. Soils also provide ecosystem services, including water purification, carbon storage and buffer, filter and habitat functions. Soil fertility is determined by several factors, including soil organic matter content and quality, soil reaction (pH and salinity) and nutrient contents, and soil structure. These in turn are the return of factor combinations and all interact with climate, vegetation and soil use by humans. Fertile soils can hardly be increased, but can easily be destroyed (European Soil Charter, 1972). On a majority of the global land area, problem soils limit the productivity of the vegetation (FAO, 2001).

While the world's cultivated area has grown by 12% from 1961 until 2009, it has decreased from more than 0.4 ha to 0.25 ha (0.17 ha in low-income countries) per person in the same period. More than 80% of the required growth of agricultural production until 2050 is expected to come from yield enhancement on currently cultivated land (FAO, 2011). Therefore, maintaining resp. rehabilitating soil fertility is an absolute imperative. According to Oldeman (1998), the productivity of the global arable land and pastureland has decreased by an average 13% and 4%, respectively, during the second half of the 20th century. The most important processes of soil degradation (by area) are water erosion, wind erosion, salinisation, compaction and chemical pollution (Oldeman et al., 1991; MEA, 2005). Soil sealing, soil organic matter loss, acidification, compaction and the formation or salt or metal oxide crusts pose problems on a regional scale. Soil degradation can also cause off-site damages, such as sedimentation and eutrophication of waterways, dust emissions, floods and emissions of greenhouse gases like N_2O (MEA, 2005; van der Ploeg et al., 2006).

While many of these are natural processes, human activities substantially impact on their rate and extent. The main parameters involved include the degree of soil coverage by vegetation, the intensity and frequency of tillage, the use of heavy machinery and grazing, the balance between imports and exports of nutrients and organic matter, respectively, as well as the application of fertilisers and other chemical substances. A sustainable management of soil resources must at the least prevent further losses of fertile soil by avoiding any substantial and irreversible soil degradation. Moreover, the fertility of soils should be enhanced to the highest level attainable under the respective conditions, and degraded soils should be rehabilitated wherever possible.

Sustainability goals

(1) The fertility and health of all soils, i.e. their organic matter content, structure, volume, nutrient contents, chemical reaction, water and temperature balance, are at the highest level attainable under the local pedoclimatic conditions.

Indicators and data needs

Goal	Indicator name	Description	Data needs	Minimum requirements
1	**Observed soil degradation**	Share of land surface substantially affected by processes of soil degradation	Assessment of spatial extent and intensity of operations-related water erosion, wind erosion, nutrient mining, subsoil compaction, salinisation, acidification, pollution (field data, remote sensing, model calculations). A pre-study can serve to identify relevant types of degradation.	The area affected by soil degradation does not exceed the average for areas with similar climate, soils and topography.
1	**Soil degradation risk**	Share of land surface under risk of soil degradation	Semi-quantitative risk assessments or quantitative model calculations for all relevant processes Data on soil texture, soil pH, climate, topography, land use, protective measures	Specific requirements for soil fertility aspects – e.g. soil erosion rates do not exceed regional critical levels
1	**Off-site damages**	Economic damage caused by eroded soil	Spatial extent and rates of soil deposition Value of services impaired by deposited soil	Not yet determined.
1	**Soil fertility enhancement**	Measures taken to enhance soil fertility	Share of the production area on which measures have been taken	Share of production with improvement areas is equal to the benchmark.
1	**Development of productive area**	Net loss or gain of productive land surface	Areas lost from production due to degradation or building activity Areas where productivity was restored or substantially enhanced	No net loss of productive area.

Examples of measures to improve sustainability

- provision of organic matter in sufficient quantity and good quality
- good crop rotation – diversity of crops, adaptation to local conditions
- balance of irrigation and drainage
- appropriate and targeted (spatially and temporally) fertilisation and liming
- conservation agriculture, including minimum tillage
- permanent soil cover: managed fallow, use of green manure, mulching, ley farming

- measures to prevent water erosion e.g. contour tillage, terraces, vegetation strips
- establishment and maintenance of windbreaks
- no arable farming on steeply sloping areas (replace by pasture or permanent crops)
- adapted stocking rate on pastureland

Definitions

Soil: „the unconsolidated mineral or organic material on the immediate surface of the earth that serves as a natural medium for the growth of land plants"[33]

Soil conservation: „measures intended to control or prevent soil erosion or to maintain fertility"[34]

Soil degradation: reduction in the capacity of the soil to provide ecosystem goods and services, and to support agricultural and forestry production.

Soil fertility: fertile soils provide plant roots with anchorage and a balanced supply of water, heat, air and nutrients while preventing toxic accumulations of growth-inhibiting substances (Scheffer & Schachtschabel, 1989).

Sources of information

- FAO / IIASA World Soil Database: www.iiasa.ac.at/Research/LUC/External-World-soil-database/HTML/index.html
- GLASOD soil degradation assessments: www.fao.org/nr/land/information-resources/glasod/en
- TERRASTAT land resource potentials and constraints statistics at country level: www.fao.org/nr/land/information-resources/terrastat/en
- LADA (Land degradation assessment in drylands) manuals: www.fao.org/nr/lada/index.php?option=com_content&view=article&id=152&Itemid=168&lang=en
- Global map of water erosion risk: http://soils.usda.gov/use/worldsoils/mapindex/erosh2o.html
- Global map of wind erosion risk: http://soils.usda.gov/use/worldsoils/mapindex/eroswind.html
- Calculate water erosion risk: RUSLE 2 www.iwr.msu.edu/rusle
- Calculate wind erosion risk: WEPS www.weru.ksu.edu/weps/wepshome.html
- Technologies for water and soil conservation: www.wocat.net/en/knowledge-base/technologiesapproaches.html

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33 Soil Science Society of America, Glossary of Soil Terms: www.soils.org/publications/soils-glossary. Definitions of all processes of soil degradation mentioned in the indicator protocol can be found there.

34 FAO glossary of Land and Water Terms: www.fao.org/landandwater/glossary

4.6 Material cycles (E6)

Relevance of the subject

Parallel to economic activity, the flows of materials into, within and out of the human ecenomy have reached unprecedented levels. While relative decoupling has allowed for a lower material use per unit output in many cases, absolute decoupling would be needed to prevent a growing world economy's overstraining the natural resource base. Sustainable management of material flows is thus a key component of the 'green economy' (UNEP, 2011). The risk of overstrain is greatest for materials that are non-renewable, scarce and/or not substitutable. Apart from land, water and fossil fuels (which are treated in other sections of SAFA) these criteria apply mainly to minerals and metals. To date, physical scarcity has not been a major constraint to the global availability of most metals and minerals important for agriculture and food systems. However, as recycling rates do not cover demand, increasingly lower grade ores and deposits (e.g. of rock phosphate) must be used. This requires more energy, work and investment per unit product and may cause a reversal of the long-term trend of falling resource prices.

Avoiding physical or economic scarcity of phosphorus is particularly important. This element is essential for all forms of life and thus of primary production. Shortages of phosphate supply to agricultural production would bear the threat of declining yields and increased food insecurity. Human actions have caused a 4-fold increase of phosphorus flows into the biosphere (MEA, 2005). Of the phosphorus mined for food production, 80% do not contribute to food, but end up accumulating in soils or urban landfills or eutrophicating water (Cordell et al., 2010). How long phosphorus reserves will last is disputed, with estimates ranging from less than 100 to several centuries. Nitrogen is another element for which agriculture is both the largest consumer and polluter of the environment. Since nitrogen-containing compounds, e.g. nitrate, ammonia and nitrous oxides, are very mobile, only 50% or less of the applied N really end up in crops (Crews & Peoples, 2004). Nitrogen flows from terrestrial into aquatic ecosystems have more than doubled compared to pre-industrial times (Vitousek et al., 1997). These emissions mainly originate from livestock production (UNECE, 2007). Nitrogen emissions contribute to soil acidification, eutrophication of ecosystems, reduced biodiversity, health problems in humans and animals and global warming.

The sustainable use of materials rests on the two pillars of enhanced resource efficiency and circular material flows throughout the economy. Material efficiency can be enhanced by reducing the material intensity of production and minimising wastage. In agriculture, the avoidance of unproductive nutrient losses can be achieved by optimising timing and rates of application as well as storage and application technology. At the same time, this contributes to spatially tighter nutrient cycles and thus less damage to the environment e.g. due to eutrophication.

Sustainability goals

(1) The material intensity of operations is kept at levels that do not contribute to overstraining the natural resource base.

(2) Cyclic flows of minerals and metals (e.g. of plant nutrients) are maintained to the greatest extent possible.

Indicators and data needs

Goal	Indicator name	Description	Data needs	Minimum requirements

1	**Share of problematic materials**	Percentage of total material use (raw materials, associated process materials and semi-manufactured goods) that is made up of materials that are rare and cannot be substituted	Total material use, by material Information on rarity and substitutability of materials	The share of problematic materials is equal to the benchmark.
1	**Material intensity**	Total material use per unit output	Total material use Total output, by weight, volume, value etc.	Material intensity is equal to the benchmark.
2	**Share of recycled inputs**	Percentage of total material use that is made up of recycled materials	Total material use, by material Information on the provenience resp. recycling quota of materials	The share of recycled inputs is equal to the benchmark.
2	**Nutrient use efficiency**	Recovery of applied nutrients from products, in % of total applied nutrient weight	Total amount of applied nitrogen and phosphorus Total amount of nitrogen and phosphorus contained in products	Nutrient recovery is equal to the benchmark.
2	**Nutrient balance**	Ratio of nutrient supply and demand, at farm or parcel level	Nitrogen and phosphorus demand and supply, or farm importations and exportations	Supply is not less than 50% and not more than 100% of demand.
2	**Nutrient self-sufficiency**	Share of crop and livestock nutrient demand covered from farm sources	Nitrogen and phosphorus demand Nitrogen and phosphorus supply, by source	Nutrient self-sufficiency is equal to the benchmark.

Examples of measures to improve sustainability

- consequent prioritisation: minimise material use > minimise waste > recycle wastes and use internal material sources > acquire reycled materials > acquire non-recycled material
- replacement of materials with non-renewable, insecure supply by renewable options
- replacement of material-intensive processes and machinery by more efficient alternatives
- nutrient management: establishment of farm- and parcel-level nitrogen and phosphorus balances as a basis for fertilisation planning
- targeted nutrient application using appropriate technologies, taking into account soil and weather conditions and crop development

Definitions

Non-renewable materials: resources that are not replenished through ecological cycles within years or even decades, e.g. minerals, metals (ores), fossil oil, gas and coal.

Recycled input materials: materials that replace virgin input materials, without being by-products or non-product outputs of the reporting organization (GRI, 2011).

Sources of information

- UNEP Green Economy Report: www.unep.org/greeneconomy/GreenEconomyReport/tabid/29846/Default.aspx
- European Environment Agency, on waste and material resources: www.eea.europa.eu/themes/waste
- FAO Nutrient balance calculation program: www.fao.org/agriculture/lead/tools/nutrient/en/

4.7 Waste (E7)

Relevance of the subject

While « fluid waste » (effluents) is treated in Chapter 4.4 and „gaseous waste“ (emissions) is treated in Chapter 4.3, this chapter deals with solid waste. The large quantity of global waste poses great challenges with regard to recycling and disposal. In addition, many solid wastes consist of hazardous and polluting substances. The disposal of such wastes is particularly problematic.

Due to the problems associated with waste disposal, wastes are often shipped from place to place, even across national borders. Improper transport of hazardous waste, especially its export to countries with low national regulations concerning waste treatment, can pose serious threats to humans and ecosystems.

The « Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal » regulates such waste exports, requiring informed consent about the nature of the waste. Today, 175 countries are parties to the Basel Convention. A 1995 amendment prohibits all exports of hazardous waste, but it has not yet been ratified by the necessary three-quarters of participants. The convention recognizes the urgency of the problem, but an adequate international regulatory framework has not yet been established (UNDP, 2011).

Sustainability goals

Risks to human and ecosystem health created by problem wastes are minimised by

(1) Avoiding produce loss and unnecessary waste production;
(2) Maximising recycling rates and
(3) Properly disposing all remaining wastes.

Minimum: There is no “wild” dumping or discharge of any wastes or wastewaters. All hazardous wastes are safely stored and disposed of.

Indicators and data needs

Goal	Indicator name	Description	Data needs	Minimum requirements
1	**Total weight and volume of waste by type**	Total amount of annual waste (in units volume or weight Classification into waste categories : hazardous/ non-hazardous, etc.	Regularly monitor waste generation Classify by type (hazardous/ non-hazardous If estimation is required, document and explain the estimation method, which should be acknowledged in the sector.	Not yet determined.
1	**Waste generation per unit produce**	Total weight and volume of waste (see above) related to the number of produce units produced while generating the waste	Total weight and volume of waste Total weight and volume of production	Waste generation per unit product is equal to the benchmark.

1	**Generation of hazardous waste per unit weight of product, revenue, area etc.**	See above	See above	Hazardous waste generation per unit product is equal to the benchmark.
2	**Percentage of recycling**	Percentage of material input which stems from recycled sources (from either within or outside the company) Percentage of wastes and by-products that are recycled or recyclable (in % of total waste volume or weight)	Total weight and volume of waste Total weight and volume of recycled input materials	The rate of recycled input is equal to the benchmark.
3	**Waste by disposal**	Waste by disposal method: Disposal destinations (e.g. land filling, burning, recycling, reuse etc.) Proportion of wastes segregated (in % of total waste volume or weight) Proportion of wastes that is biodegradable (in % of total waste volume or weight)- Proportion of waste shipped internationally	Total weight and volume of waste Classify by disposal method (reuse/recycling/composting/ recovery/ burn/ deep well injection/export etc.)	Priority is giving to re-use and recycling over any other disposal options whereever possible.
3	**Hazardous waste disposal**	Weight of transported/ imported/ exported/ treated waste classified as „hazardous“ by the Basel Convention (Annex I, II, III and IV)	Total weight and volume of hazardous waste Destinations of all hazardous wastes > determine share of hazardous waste exported	No hazardous waste is exported to countries with lower waste disposal regulation than the country of company operation.
3	**Quality of waste storage facilities**	Risk assessment of waste storage facilities before the point of disposal (qualitative indicator) with particular regard to risk and frequency of accidental discharges	Risk assessment	No immediate risk of accidental discharges.

Examples of measures to improve sustainability

- Apply the “waste hierarchy” by giving preference to the measures at the top of the hierarchy
    1. Reduce or prevent waste arising – waste minimisation initiatives to help businesses and households reduce the amount of waste that they create
    2. Reuse waste – reuse waste and thus avoid energy consuming reprocessing
    3. Recycle – reprocess waste for further use

4. Energy recovery – generating energy from waste using a variety of technologies
5. Disposal – put waste in landfill sites. (Source: Local Government Improvement and Development, 2010, UK)

Definitions

Recycled input materials: materials that replace virgin materials that are purchased or obtained from internal or external sources, and that are not by-products and non-product outputs (NPO) produced by the reporting organization (GRI, 2011).

Sources of information

- OECD Working Group on Waste Prevention and Recycling
- Ban Amendment to the Basel Convention on the Control of Transboundary Movements ofHazardous Wastes and their Disposal, 1989.
- Air and Waste Management Association: www.awma.org
- www.unep.org/hazardoussubstances

4.8 Biodiversity (E8)

Relevance of the subject

Biodiversity loss is one of the grand challenges for sustainable development. According to Rockström et al. (2009), mankind has already overstepped the planetary boundaries with respect to biodiversity loss. MEA (2005) has determined five main drivers for biodiversity loss: Habitat change/destruction, overexploitation of natural resources, climate change and emissions/pollution, and invasive species (Neobiota).

Agriculture and food production, as one of the main users of land and other natural resources, contributor to climate change and reason for the import of invasive species, contributes substantially to this biodiversity loss.

Sustainability goals

(1) The integrity, diversity and functioning of ecosystems (including the species they host) in the company's sphere of influence is maintained or, where necessary, restored.

Indicators and data needs

Goal	Indicator name	Description	How to assess	Minimum requirements
1	**Species diversity**	Average number of species found in habitats within the sphere of influence	Assess the number of species found on the agriculturally utilised area Alternatively, assess the number of effective measures used to enhance or maintain species diversity	Minor measures taken to enhance species diversity.
1	**Stocking density**	Production intensity is defined by the number of livestock units per hectare	Calculate the average number of livestock units kept per ha of agriculturally utilised area	Stocking density does not exceed the regional benchmark.

1	**Amount of toxic substances used**	Toxic substances include plant protection products, cleaning agents, heavy metals, etc.	Calculate the annual amount of toxic substances used for plant protection, livestock treatments, cleaning etc. used per hectare	No use of highly toxic substances (e.g. nationally banned pesticides plus POP banned through the Stockholm convention[35]).
1	**Habitat diversity**	Number of habitats found within sphere of influence Agro-biodiversity	Provide a list of habitats that can be found on agricultural land Determine agro-biodiversity	Habitat diversity is equal to the regional benchmark.
1	**Share of ecological compensation areas**	Ecolocial compensation areas (hedges, trees, etc.) are a hotspot for biodiversity on farm land	Calculate the proportion of areas where natural or near-natural ecosystems are partially or totally protected from human interventions (in % of total area)	Share of ecological compensation areas is not below critical value (e.g. 17%[36]).
1	**Number of rare livestock and plant species cultivated**	Rare, traditional or indigenous livestock and plant breeds used	Number of rare, traditional or indigenous plant and livestock breeds	Minor measures taken to conserve rare, traditional and indigenous plant and livestock breeds.
1	**Deforestation**	Rate of deforestation	Number of hectares of virgin forest deforested	Not yet determined.
1	**Invasive species imported**	Imports of (potentially) invasive species	Number of cases of potentially invasive species imported by the company	No incidences.

1 35
2 http://chm.pops.int/Convention/ThePOPs/ListingofPOPs/tabid/2509/Default.aspx

1 36
2 Target 11 of the Aichi Biodiversity Targets: www.cbd.int/sp/targets

Examples of measures to improve sustainability

Definitions

Areas of high biodiversity value: habitats recognized for important biodiversity features by governmental or non-governmental organizations, or through a biodiversity assessment. This includes, but is not restricted to, areas protected by law.

Biological diversity: „the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems."

Ecosystem: „a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit." [37]

Rare species: Species listed as vulnerable, endangered or critically endangered by the IUCN[38] *Red List, or found to be vulnerable or endangered by scientific sources or a field study.*

Sources of information

- Atlas of the Biosphere, University of Wisconsin: www.sage.wisc.edu/atlas
- Stockholm Convention on Persistant Organic Pollutants: http://chm.pops.int/default.aspx
- Toxicity rating of crop protection products: Environmental Impact Quotient, www.nysipm.cornell.edu/publications/eiq
- Global Biodiversity Information Facility: www.gbif.org

37 Convention on Biological Diversity, article 2: www.cbd.int/convention/articles/?a=cbd-02

38 International Union for Conservation of Nature and Natural Resources: www.iucnredlist.org

4.9 Animals (E9)

Relevance of the subject

Livestock are kept in most agricultural production systems. Globally, 1.5 billion cattle and buffalos, 2 billion sheep and goats, 0.9 billion pigs and 18.4 billion chicken were kept in 2008 (FAOSTAT, 2010). In regions like the savannas of the Sahel, the steppes of Central Asia and the alpine meadows, an adapted pasture management is the only possibility for agricultural land use. Permanent grassland covers 68% of the global agricultural area (FAOSTAT, 2010). Livestock production accounts for 40% of global agricultural production (Steinfeld et al., 2006). It thus, however, also account for much of agriculture's ecological impact. Some 20% of all pasture areas are affected by soil degradation. Close to 1/3 of the global arable land is used to grow animal fodder. Livestock production is a major source of man-made ammonia and methane emissions: livestock-related CH_4 und CO_2 emissions account for 18% of humanity's total greenhouse gas emissions (Steinfeld et al., 2006).

Livestock production under conditions which are inappropriate for animal welfare and health is a major concern across production systems and geographical regions. Common problems include overstocking, reliance on unadapted breeds, excessive or inadequate use of veterinary medicines, lack of space, light, clean water and adequate fodder, as well as cruel treatment.

Where animal husbandry systems are not conducive to animal health, the excessive use of antibiotics, hormones, anesthetics and other veterinary drugs is a further potential ecological problem. Up to 90% of all antibiotics used in livestock fattening end up in urine and manure. Via animal excreta, these chemicals and their metabolites enter soils and waterways. The evolution of pathogens resistant to antibiotics is a further risk (Boxall et al., 2003; Stoob et al., 2005; Helmholtz-Zentrum, 2007). Moreover, inappropriate or even inhumane treatment of animals reduces their productivity and thus results in economic damage.

Ethical considerations are a further reason to take care of animal welfare. Being sentient creatures, animals are respected in many cultures and protected by law in many countries[39]. For ethical and agronomic reasons as well, they have to be kept such that their well-being is ensured, which means that animals must be kept in an environmentally unproblematic and species-appropriate way. The latter encompasses the "five freedoms": freedom from hunger and thirst, from discomfort, from pain and disease, from constraints to natural behavior, and from fear and distress (FAWC, 1979).

Sustainability goals

(1) Animals are kept free from hunger and thirst, discomfort, pain, injury and disease, fear and distress. Minimum: No inhumane treatment of animals is tolerated in operations.

(2) Animals are free to express their normal behaviour.

Indicators and data needs

Goal	Indicator name	Description	Data needs	Minimum requirements

39 In Switzerland, Austria and Germany, animal rights are included in constitutional law.

1, 2	**Animal welfare**	Assessment of housing conditions, body condition and behaviour of animals	Information on housing conditions, body condition and behaviour of all animal categories kept	No animals kept under inhumane conditions.
1	**Housing conditions**	Assessment of lighting, aeration, noise, space, hygiene and water supply	Assessment of housing conditions in all types of stable and on all types of pasture; including visual rating e.g. of panting animals (signs of stress)	No animals kept under inhumane conditions.
1, 2	**Animal health**	Incidences of illnesses and injuries (percentage of animals)	Total number of animals by category Records of numbers of animals affected by illnesses and injuries	Frequencies of illnesses and injuries do not exceed the benchmark for the animal category.
1, 2	**Animal mortality**	Animals lost due to diseases, injuries and accidents (percentage of animals)	Total number of animals by category Records of numbers of animals that died prematurely	Mortality does not exceed critical thresholds for the animal category (see e.g. „Welfare Quality“[40]).
1, 2	**Use of veterinary medicines**	Amounts of veterinary medicines used prophylactically, curatively and to boost performance	Records of veterinary treatments and reasons thereof Alternative: annual cost of veterinary treatments	No use of antibiotics and hormones for pure performance boosting. No unnecessary prophylactic use of veterinary medicines.
2	**Species-appropriate behaviour**	Assessment of possibilities for animals to express normal behaviour	Assessment of husbandry for all animal categories: space, bedding, contact with conspecifics, etc.	No unnecessary limitations to the natural behaviour of animals.
1, 2	**Zootechnical alterations**	Share of animals subject to tail docking, beak clipping, dehorning etc. without use of analgesics or anaesthetics (percentage of animals)	Total number of animals by category Records of zootechnically altered animals, including those bought in an altered condition Records of treatments during alteration	No animals treated without precautions to prevent pain.

Examples of measures to improve sustainability

- replacement of illness-prone breeds and illness-fostering housing conditions (e.g. too high density, insufficient lighting, bad air quality) with better alternatives
- targeted breeding for adaptation to local conditions and robustness
- prevention rather than curing of illnesses and injuries

Definitions

40 www.welfarequality.net/everyone/41858/5/0/22

Species-appropriate behaviour: animals are able to express normal, non-harmful, social behaviours, and to express other normal species-specific natural behaviours such as foraging.

Sources of information

- Animal Welfare Quality: www.welfarequality.net/everyone
- Farm Animal Welfare Committee of the UK: www.defra.gov.uk/fawc

4.10 Strategic management (C1)

Relevance of the subject

- publicly accessible goals for all sustainability dimensions
- procedures & principles to deal with trade-offs between sustainability dimensions

Sustainability goals

(1) The sustainability principle is fully integrated into the enterprise's/company's management system: target system, planning documents, operations and monitoring take into account "people, planet and profit" and the interactions between those dimensions.

Indicators and data needs

Goal	Indicator name	What is measured?	Data needs	Minimum requirements
1	**Strategy and planning for sustainable development**	Quality and completeness of planning instruments and documentation for sustainability management	Overview of documentation and instruments for the economic, environmental, social and governance dimensions	Qualitative information on performance exists for each sustainability dimension.
1	**Due diligence**	Implementation of due diligence, risk assessment, and ex ante and ex post impact assessment on economic, environmental, social and governance issues	Overview of sustainability categories, for which due diligence etc. procedures are implemented	Due diligence or related procedures are implemented in each domain with critical sustainability gaps.
1	**Strategic investment**	Share of annual profit invested into research and development, employee education and measures and facilities that improve sustainability performance	Value of investments into the three areas Annual profit	The share of strategic investments is equal to the benchmark.
1	**Full-cost accounting**	Internalisation of external effects into accounting and decision-making	Share of operations in total product output or total revenue, where full-cost accounting is at least partially implemented	The share of full-cost accounting is equal to the benchmark.

Examples of measures to improve sustainability

Definitions

Full-cost accounting = in SAFA, the collection and presentation of information about the economic, environmental and social costs of operations

Sources of information

4.11 Operating profit (C2)

Relevance of the subject

Companies, as economic entities, are the key provider of goods and services to society. Companies only exist if they can geneate suffient profit for remunerating the production factors used. Thus, for maintaining a continous supply of goods and services in the long term, profitability and solvency for investments needs to be secured.

Many economic entities in the agricultural sector, in particular family farms and farms in developing countries suffer from low profitability. This is a main driver for a limited economic sustainability and indirectly may lead to negative impacts on other social or environmental sustainability categories.

Sustainability goals

(1) Operations generate a positive cash flow in the short term and sufficient profit for remuneration of production factors in the long term.

(2) The generated profit allows for the build-up of a sufficient liquidity reserve.

Indicators and data needs

Goal	Indicator name	What is measured?	How to assess	Minimum requirements
1	**Profitability of ecosystem use**	Profit is defined by the total revenues minus total costs of production per year. Total profit is divided by the number of hectares as one of the main production factors.	Total profit of the company per year and divide by factor use (land in ha)	Land use profitability is equal to the regional benchmark.
1	**Labour profitability**	Profit is defined by the total revenues minus total costs of production per year. Total profit is divided by the number of labour units as one of the main produciton factors.	Total profit of the company per year and divide by factor use (labour units)	Labour profitability (calculated based on fair wages) is equal to the benchmark.
2	**Operating cash flow**	Operating cash flow	Operating cash flow	Operating cash flow is positive.
2	**Liquidity crises**	Frequency of liquidity crises	Frequency and duration of inability to pay debts	No liquidity crises.

2	**Liquidity reserve**	Ability to withstand periods of non-payment of buyers	Liquid assets (e.g. cash and marketable assets) Operating costs Frequency and duration of past payment suspensions Assessment of market risks	The company's liquidity reserve is sufficient to cover operating costs for a defined critical period.

Examples of measures to improve sustainability

Definitions

Liquidity crisis: a situation where the company's liquid assets are insufficient to cover short-term obligations, usually due to lack of cash flow.

Operating cashflow: cash generated from business operations (cash income from customers minus cash paid from suppliers) less taxes, interest, investments.

Sources of information

4.12 Vulnerability (C3)

Relevance of the subject

- diversification of suppliers and buyers (spread farm income streams, avoid cluster risks)
- stocks / buffers against and kind of turbulence (e.g. weather-related)
- Diversity of income is a possible indicator for resilience to economic risk. Diversity in this sense can be calculated in exactly the same way as measuring the species diversity of an ecosystem, or the linguistic diversity of a region. One way that ecologists and linguists do this is to ask "*what is the probability that two organisms/people selected at random in a given area will belong to the same species/speak the same language?*" The more diverse the area, the lower the probability that they will be the same. One could also ask *"what is the probability that two random Euros earned by an enterprise come from the same source?"*
- stability of economic KPIs
- stability of supplier-buyer relations (permanent contracts and commitment to specific purchasing volumes)
- stability of staff (fluctuation)
- business plan with commitment to long-term economic viability
- Climate Change adaptation (FAO framework)

Sustainability goals

(1) The enterprise/company's existence is not threatened by market turbulence, disruptions of supply and sales or lack of personnel.

Indicators and data needs

Goal	Indicator name	What is measured?	Data needs	Minimum requirements
1	**Vulnerability on supply markets**	Risk to operations due to inavailability of essential inputs (raw materials, energy, water, land, etc.)	Distribution of input quantities to suppliers (Gini coefficient) Risk of drop out per supplier Rating of the stability of relations with suppliers (e.g. past problems) Number of alternative suppliers	At least one stable supplier or several alternative suppliers for each essential input.
1	**Vulnerability on product markets**	Risk to operations due to loss of buyers of essential products	Distribution of sold quantities to buyers (Gini coefficient) Risk of drop out per buyer Rating of the stability of relations with buyers (e.g. past problems) Number of alternative buyers	At least one stable buyer or several alternative buyers for each essential product.
1	**Financial vulnerability**	Risk to operations due to inavailability of capital	Level of indebtedness (% of total capital or in relation with operative cash flow) Degree of financial dependence derived from insecure government funding (% of total revenue) Distribution of debt to	At least one stable lender or several alternative lenders. Less than 100% debt service coverage ratio.

			lenders (Gini coefficient) Debt service coverage ratio (% of debt service limit that is utilised) Rating of the stability of relations with lenders (e.g. past problems) Number of alternative lenders	
1	**Human resources vulnerability**	Risk to operations due to inavailability of workforce	Average duration from announcement to filling of positions Matching of job applicant qualifications with requirements	No major risk of total disruption of production due to lack of qualified workforce.
1	**Vulnerability of production**	Risk to operations due to interruptions of production	Geographical distribution of production sites in relation with major (e.g. climatic) production risks Rating of production risks Rating of the stability of production (e.g. past interruptions)	No major risk of total disruption of production due to climatic or political risk.
1	**Stability of business relations**	Duration and stability of arrangement of relations	Percentage of suppliers, buyers and workforce with permanent contract Annual fluctuation in supplier and buyer relations and in workforce	Share of stable relations is equal to the benchmark.

Examples of measures to improve sustainability

- diversification of supplier and buyer network
- stabilisation of supplier, buyer, lender and personnel relationships
- risk assessment for all major inputs, capital, personnel and sales; combined with information on alternative suppliers, buyers and lenders
- investment into enhanced resilience to natural risks (e.g. climate)
- investment into human resources development
- avoidance of excess indebtedness, i.e. debts that cannot be covered from operative cash flow (in a conservative scenario)

Definitions

Sources of information

4.13 Local economy (C4)

Relevance of the subject

Local economic development is considered a cornerstone of sustainable development (UN-Habitat, 2009). The strengthening of local economies means to support people`s economic resilience towards global economy fluctuations (e.g. world market food prices). It furthermore means employment and local development (e.g. of infrastructures) and a high quality of life. As a side-effect, local economies reduce environmental pressures related to transportation of goods over large distances. With economic globalization driven by powerful transnational corporations, many local economies are deteriorating and under threat. Unemployment and low infrastructure result from weak local economies and result in the global phenomenon migration into cities.

Local economic development is defined as a process in which local citizens from all sectors (incl. food and agriculture sector companies) work together to stimulate local commercial activity.

Sustainability goals

(1) The enterprise/company generates value in the region by hiring regional staff and sourcing from regional suppliers.

(2) The company contributes to the general economic and social development of the region.

Indicators and data needs

Goal	Indicator name	What is measured?	Data needs	Minimum requirements
1	**Regional hiring**	Percentage of regionally hired workforce	Total number of workers Number of workers from the region	No discrimination in hiring against regional applicants. The share of regionally hired workers is equal to the benchmark.
1	**Regional employment generated**	Jobs created in the region	Number of jobs created by the company Number of jobs before the company started operating (adjustment may be necessary)	Operations did not cause a net loss of jobs in the region.
1	**Regional procurement**	Percentage of inputs sourced from the region	Total quantity of inputs (value, weight or volume) Quantity of inputs sourced from the region	The share of regionally sourced inputs is equal to the benchmark.
1	**Regional value added**	Sales value of local and regional brands	Sales value generated through products marketed under local and regional brands	The sales value of „regional products“ is equal to the benchmark.

2	**Contribution to regional economic development**	Investment into the regional economy in relation to profit	Investment into production facilities and infrastructure (five-year average) Average annual profit	Regional investment is equal to the benchmark.

Examples of measures to improve sustainability

Definitions

local = for the purposes of these Guidelines, ‚local' and ‚regional' are used synonymously.
region = regions can be defined based on homogeneity and functionality, both in relation with the activities whose sustainability is assessed. There is no single definition of the perimeter (in km) that can be used for distinguishing ‚regional' from ‚supra-regional'.

Sources of information

- United Nations Human Settlements Programme, 2009: "Promoting Local Economic Development through Strategic Planning - – Volume 5: Trainer's Guide"

4.14 Decent livelihood (C5)

Relevance of the subject

- Business actitivies are the primary sources of livelihoods, i.e. the means for securing the necessities of human lives. In many regions of the world, agriculture and the food sector are primary economic sectors.
- payment of living wage; consider premiums and deductions?
- integrate social security? (employees with sufficient pension and social security benefits)
- This indicator is based on average *per capita* income of the farm, forestry, or fishery enterprise. This can be measured in absolute terms, or compared with the national average and expressed as a ratio. Net income per capita of an enterprise can be calculated as its gross value added (pay plus profits) divided by the number of employees. The average *per capita* income does not take inequality into account, which can also be calculated if required. Average income is a more useful indicator than absolute poverty, which is only meaningful in the poorest countries and communities.

Sustainability goals

(1) The company pays all employees wages that guarantee their ability to earn a livelihood, including sufficient pension and social security benefits for preventing poverty of employees. Minimum:

Indicators and data needs

Goal	Indicator name	What is measured?	How to assess	Minimum requirements
1	**Wage level**	Level of workforce remuneration (lowest wages paid)	If data on regional average wage are not available, use local living wage or sector agreement as reference NB: In all wage calculations, corrections for premiums, deductions and in-kind payments must be made.	Lowest wage is above local living wage.

Examples of measures to improve sustainability

Definitions

livelihood = a means of securing the necessities of life (Oxford Dictionary).
living wage = a wage which is high enough to maintain a decent standard of living, given the area-specific cost of living.
poverty line/threshold = the minimum level of income necessary to achieve a decent standard of living, given the area-specific cost of living.

Sources of information

- Institute of Development Studies (IDS) (2011): Introduction to livelihoods and agriculture. http://www.eldis.org/go/topics/dossiers/livelihoods-connect/agriculture/introduction
- Organization for Economic Co-Operation and Develepment (OECD) (2006): Promoting Pro-Poor Growth. Agriculture. Http://www.oecd.org/dataoecd/9/60/37922155.pdf

4.15 Human rights (S1)

Relevance of the subject

Basic human needs and rights, as defined in the International Bill of Human Rights (see under 4.2.3) and specified in the Declaration of Fundamental Principles and Rights at Work (ILO, 1998), are a framework for human development that has been acclaimed by a vast majority of countries. Where the principles underlying these international declarations and covenants on human and labour rights have been put into national law, their relevance to the food and agriculture industries is obvious. Yet, in many countries and sectors of the economy, human rights violations are a reality, including beatings and violence, the denial of basic freedoms, intimidation and harassment, and even torture and death[41]. The question of how business, particularly multinational enterprises, should deal with human rights issues not covered by national law has been a subject of intensive debate.

Up to date, arguably the best-grounded position on this issue is the United Nations 'Protect, respect and remedy' framework, proposed by the Special Representative of the Secretary-General on the issue of human rights and transnational corporations and other business enterprises, John Ruggie (UN, 2011). The 'respect' pillar of the framework addressed business enterprises which are responsible of respecting human rights wherever their own business activities and those directly linked with their business relationships cause human rights impacts. Human rights can thus be considered 'a universal benchmark for what should be standards of behavior for businesses' (BLIHR, 2009). Procedures for the implementation of human and labour rights in business enterprises have been proposed, e.g. a twelve-step 'due diligence for human rights' (Taylor et al., 2009), and the 'essential steps' recommended by the Business Leaders Initiative on Human Rights (BLIHR, 2009).

Many companies are proactively recognising their potential to support human rights within their value chains and also the benefits which can arise from doing so. These companies go beyond observing human rights-related laws and facilitate human and labour rights globally. Consequently, several international standards and multistakeholder initiatives explicitly address human and labour rights, including e.g. SA 8000 (SAI, 2008) and the Code of Conduct of the Business Social Compliance Initiative (BSCI, 2009); for further examples, see above under 4.2.3.

Sustainability goals

(1) All operations fully comply with the declaration of human rights and the ILO core conventions.

(2) Complete remedy is provided to victims of human rights violations related with the company's operations and responsibilities.

Indicators and data needs

Goal	Indicator name	What is measured?	Data needs	Minimum requirements

41 For explanations and examples, see www.business-humanrights.org/Categories/Issues/Abuses.

1	**Child labour**	Frequency of incidents of unacceptable forms of child labour Percentage of underage workers doing unacceptable forms of labour	Age, type of work and schooling situation of underage workers Reported incidents of child labour	No unacceptable forms of labour exist anywhere in operations.
1	**Forced labour**	Frequency of incidents of forced labour	Reported incidents of forced or compulsory labour (incl. bonded and prison labour)	No forced or compulsory labour exists anywhere in operations.
1	**Collective bargaining and association**	Percentage of workforce who are free to organise, associate and collectively bargain	Percentage of workforce for whom the rights to organise, associate and collectively bargain are limited	All workers can exercise the right to collectively bargain, associate and organise.
1	**Work contracts**	Shares of workers who have a legally binding work contract and no vulnerable employment, and who benefit from pension and security schemes.	Share of workforce with legally binding written work contract Share of workforce with vulnerable forms of employment (temporary, seasonal etc. contract) Share of workforce with pension and security benefits	All work contracts comply with national law. The share of vulnerable employment does not exceed the benchmark. The share of workforce with pension and security benefits is not below the benchmark.
1	**Wage payment**	Timeliness and reliability of wage payment	Rating of timeliness and reliability of wage payment (documented by payment records, payslips)	All wages are paid completely and on time.
1	**Working hours**	Percentage of workforce whose working time arrangements are fully compliant with ILO standards	Percentage of workforce whose working hours and right to take breaks and leave and compensate or remunerate overtime comply with ILO standards	The share of workers with non-ILO-compliant working hours does not exceed the benchmark.
1	**Decent working conditions**	Percentage of workforce working under decent conditions	Percentage of workforce with access to decent housing (if applicable), clean sanitary facilities, clean drinking water and effective medical aid	All workers benefit from a decent working environment.
1	**Conflict**	Working time lost due to industrial disputes	Working time lost (in person-days) due to industrial disputes, strikes and lockouts	The working time lost due to disputes does not exceed the benchmark.

1, 2	**Human rights violations and remedy**	Frequency of human rights violations and share of non-remedied violations	Frequency of reported human rights violations in the company's sphere of influence Percentage of human rights violations in which no adequate remedy was offered	No human rights violations occur within the company. Remedy is offered for all human rights violations of business partners and action is taken to prevent further violations

Examples of measures to improve sustainability

Definitions

Collective bargaining: all negotiations that take place between an employer, a group of employers or one or more employers' organisations, and one or more workers' organisations, to determine working conditions and terms of employment and/or relations between employers and workers and/or relations between the participating organizations.[42]
Employee: person recognized as an employee of the reporting organization (GRI, 2011).
Worker: „any person performing work, regardless of the contractual relationship" (GRI, 2011).

Sources of information

- Text of the ILO core conventions in several languages: www.labourstart.org/rights
- Universal declaration of human rights: www.un.org/en/documents/udhr
- International Trade Union Confederation: www.ituc-csi.org
- International Labour Organization (ILO) (2006): Tripartite Declaration of Principles Concerning Multinational Enterprises and Social Policy. http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/---multi/documents/publication/wcms_094386.pdf
- Business Leaders Initiative on Human Rights (BLIHR), Guide for integrating human rights into business management: www.integrating-humanrights.org

42 International Labor Organization, C154 Collective Bargaining Convention: www.ilo.org/ilolex/cgi-lex/convde.pl?C154

4.16 Equity (S2)

Relevance of the subject

Discrimination in employment and occupation takes many forms, and occurs in all kinds of work settings. It entails treating people differently because of certain characteristics, such as race, colour or sex, which results in the impairment of equality of opportunity and treatment. In other words, discrimination results in and reinforces inequalities. The freedom of human beings to develop their capabilities and to choose and pursue their professional and personal aspirations is restricted, without regard for ability. Skills and competencies cannot be developed, rewards to work are denied and a sense of humiliation, frustration and powerlessness takes over.

Gender

- Citations from the 2011 HDR (UNDP, 2011)
  - Investments that improve equity—in access, for example, to renewable energy, water and sanitation, and reproductive healthcare—could advance both sustainability and human development. Stronger accountability and democratic processes, in part through support for an active civil society and media, can also improve outcomes. Successful approaches rely on community management, inclusive institutions that pay particular attention to disadvantaged groups, and cross-cutting approaches that coordinate budgets and mechanisms across government agencies and development partners.
  - Recent studies reveal that not only is women's participation important but also how they participate—and how much. And because women often show more concern for the environment, support proenvironmental policies and vote for proenvironmental leaders, their greater involvement in politics and in nongovernmental organizations could result in environmental gains, with multiplier effects across all the Millennium Development Goals.
  - Worsening income inequality has offset large improvements in health and education inequality, such that the aggregate loss in human development due to inequality sums to 24 percent.
  - Income inequality has deteriorated in most countries and regions— with some notable exceptions in Latin America and Sub-Saharan Africa.
- Women are involved and play a significant role not just at all various stages of food production, but also processing and preparing. Yet, due to various reasons about three fifth of the world's poor are women, with a great number of them depending on agriculture. Although 60 to 80% of the food production in developing countries is managed by rural women, female farmers are often disadvantaged. In many countries women are still constricted in their land-owner rights and their ability to receive loans. In order to turn agricultural products into income, women need to have infrastructure and markets accessible (Ministry of Foreign Affairs of Denmark, 2011a).
- Great social and economic cost arises from rural women's lack of education and assets. Wasted human capital and low labour productivity stifling rural development and progress in agriculture can ultimately threaten food security of women and men (FAO, 2011).
- Women often times either benefit last from economic growth and development or are faced with adverse effects. As farmers are typically perceived as 'male' by relevant persons and decision makers, activities and agricultural inputs that enhance production

capacity do often not target women (Ministry of Foreing Affairs of Denmark, 2011a). This, although the economic empowerment of women in agriculture is a key factor in poverty reduction and development (Ministry of Foreign Affairs of Denmark, 2011b).

- "Where women are under-represented in business it is often a reflection of wider social inequalities, but companies can make an active effort – for example as part of their commitments to human rights and diversity – to recruit women, buy from women-owned supplier businesses, and where appropriate tailor products and services to target women's needs" (Nelson; Prescott, 2008, p.15).

- "Strengthening women's economic capacity as entrepreneurs, employees and producers – by employing more women and supporting workplace diversity programmes, or developing business linkages or credit programmes with female entrepreneurs, companies can develop technical and marketing skills, strengthen negotiation and bargaining tactics, increase access to and influence over new technologies, build networks and business associations and identify new market opportunities" (Nelson; Prescott, 2008, p.15).

Sustainability goals

(1) The company pursues a strict non-discrimination (on the basis of sex, disability, ethnicity, etc.) policy, including no discrimination in hiring.
(2) The company pays equal pay for equal work.
(3) The company proactively supports the career development of its workers with a special focus on women, minorities and disadvantaged staff.
(4) The company offers accommodation of disabilities in the workplace.

Indicators and data needs

Goal	Indicator name	What is measured?	Data needs	Minimum requirements
1	**Recruitment**	Incidences of discrimination	Survey among human resource responsible: Assessment of recruitment procedure (e.g. job adverts, short-list, interview, selection criteria list)	No incidences.
1, 2	**Remuneration**	Incidences of non-equal remuneration for comparable work	Wage gap - % wage discrimination between different groups, e.g. men and women, permanent and temporary staff, local and migrant workers etc. doing similar work	No gap.

1, 3	**Personnel development**	Quantity of training Access to training	Average number of training days aggregated by different groups Share of (concerned) workforce with access to pro-active measures – such as trainings and career development programs – to promote women, handicapped, youth etc.	No gap.
1	**Equal treatment and protection**	Incidences of discrimination and harassment	Survey among personnel and human resource responsible: Frequency of incidents of discrimination and harassment against women, minorities, migrants etc. (possibly rate actions taken)	No incidences.
4	**Accessibility to disabled persons**	Existence of appropriate infrastructure	Share of workplaces appropriately equipped for disabled persons	Share of approriately equipped workplaces is equal to the benchmark.

Examples of measures to improve sustainability

Definitions

Discrimination against women: "any distinction, exclusion or restriction made on the basis of sex which has the effect or purpose of impairing or nullifying the recognition, enjoyment or exercise by women, irrespective of their marital status, on a basis of equality of men and women, of human rights and fundamental freedoms in the political, economic, social, cultural, civil or any other field." (UN, 1979).

Discriminating directly or indirectly: "refers to discrimination because of a person's protected characteristic (direct); or discrimination that occurs when a provision, criteria or practice is applied that creates disproportionate disadvantage for a person with a protected characteristic as compared to those who do not share that characteristic (indirect)"[43].

Equality at work: all individuals should be accorded equal opportunities to fully develop the knowledge, skills and competencies that are relevant to the economic activities they wish to pursue.

Gender: "social (as opposed to biological) differences between women and men. These differences have been acquired; they are changeable over time and have wide variations both within and between cultures" (Ministry of Foreign Affairs of Denmark, 2011a).

Sources of information

- Gender Inequality Index of the United Nations Development Programme: http://hdr.undp.org/en/statistics/gii/
- Food and Agriculture Organization of the United Nations (FAO) (2011): Why Gender. http://www.fao.org/gender/gender-home/gender-why/why-gender/en/)
- International Labor Organization (ILO) 2011: Equality at work: The continuing challenge. Report of the director-general. Geneva. http://www.ilo.org/wcmsp5/groups/public/---ed_norm/---declaration/documents/publication/wcms_166583.pdf

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4.17 Occupational health and safety (S3)

Relevance of the subject

Occupational safety and health issues are of paramount importance for the social sustainability of personnel relations, for the company and for national economies. There is growing evidence that improving healthcare, fighting disease and increasing life expectancy are all essential for supporting economic growth, which in turn underpins long-term business success. The health of employees has a direct impact on their productivity at all types of work (Nelson & Prescott, 2008).

Worldwide, more than 350,000 work-related fatal accidents and 2 million cases of work-related fatal disease occur each year. The number of non-fatal accidents (causing more than 4 days absence from work) is estimated to be 1,000 times higher (Al Tuwaijri, 2008). Fatal and non-fatal incidences impose a high cost on company and personnel alike. Small companies are particularly prone to absences from work. The Federal Ministry of Labour and Social Affairs of Germany estimated that each worker is incapacitated for work for 12 days a year – causing a yearly financial loss worth 43 billion Euros (BMAS, 2010). Beside loss of work performance, the company sustains follow-on expenses for administration, recruitment and efforts for reintegration and due to loss of knowledge.

In the food and primary sectors, the occupational security and health situation is very diverse due to branch-specific hazards and risks. The situation in primary production is particularly hazardous with high numbers of incidences (Toscano, 1997; EWCS, 2007). Straining physical work, exposure to harming substances (e.g. chemicals, persticides, dust), work with machines, equipment and animals all can cause health problems.

The indicator concept in SAFA borrows the WHO definition of a healthy workplace: *"A healthy workplace is one in which workers and managers collaborate to use a continual improvement process to protect and promote the health, safety and well-being of workers and the sustainability of the workplace by considering the following, based on identified needs: health and safety concerns in the physical work environment; health, safety and well-being concerns in the psychosocial work environment including organization of work and workplace culture; personal health resources in the workplace; and ways of participating in the community to improve the health of workers, their families and other members of the community"* (Burton, 2010).

Note that some aspects relevant for health are adressed in other SAFA sustainability categories. For example, working time - a critical factor for health and safety - is adressed under 'Human rights'.

Sustainability goals

(1) There are no health and safety concerns in the physical work environment (e.g. physical, chemical, biological and ergonomic hazards).
(2) There are no health, safety and well-being concerns in the psychosocial work environment (e.g. work organization and workplace culture)
(3) The company provides personal health resources in the workplace.
(4) The company effectively participates in the community to improve the health of workers, their families and other members of the community.

Indicators and data needs

Goal	Indicator name	What is measured?	Data needs	Minimum requirements

1, 2	**Accident and injury rates**	Recordable Incident Rate (number of personnel involved in recordable injury of illness per 100 persons) Severty rate (number of lost days per recordable incident)	Number of recordable cases, number of labor hours worked Total number of lost work days, total number of recordable incidents	Accident and injury rates do not exceed the benchmark.
1, 2	**Capacity building**	Company activities in the field of personnel capacity building (e.g. trainings and further education)	Share of personnel adequately trained on occupational health and safety Share of workforce doing dangerous work who is adequately trained	No dangerous work is done by personnel without adequate training.
1	**Physical Work Environment**	Company activities addressing physical work environment	Number of activities, effectiveness of activities in this field Share of workforce with access to adequate protective gear and medical assistance Rating of the storage and application of dangerous substances Rating of fire safety Rating of exposure of workers to hazardous substances or situations Presence of security and health concepts	No inacceptable shortcomings or risks in any of the addressed areas.
2	**Psychosocial work environment**	Company activities addressing psychosocial work environment	Number of activities, effectiveness of activities in this field.	Minor measures taken to enhance the psychosocial work environment.
3	**Personal health resources**	Company activities adressing personal health resources (promoting healthy lifestile)	Number of activities, effectiveness of activities in this field.	Minor measures taken to enhance personal health resources.
4	**Community**	Company activities adressing community related health issues	Number of activities, effectiveness of activities in this field.	Minor measures taken to enhance community health.

Examples of measures to improve sustainability

- Training courses addressing health issues (e.g. handling hazardous substances, work-life balance).
- Investments in safety standards and adequate technologies.

- Regular evaluations the safety performance through audits and inspections. Baseline audits or inspections. Follow-up audits and inspections after implementation of measures.
- analysis of near miss, first aid incident, or accident
- Involvement of employees in improving processes and making equipment safer.

Definitions

Work organization:

Workplace culture:

Sources of information

4.18 Capacity building (S4)

Relevance of the subject

- "Personnel training and development is a process that has the potential of developing human expertise required to maintain and change organisations. As such, training and development may be strategically aligned to its host organisation. It also has the potential of developing the expertise required to create new strategic directions for the host organization" (Swanson, 2003).
- "A well-educated and skilled workforce is one of the most important factors in ensuring national and corporate competitiveness in an information-based global economy. More generally, there is clear evidence that investments in education, especially girls' education, can lead to better healthcare and nutrition, declining birth rates, poverty reduction and improved economic performance at both the family level and beyond. The private sector can support the goals of increased access to education, improved quality and relevance of education, and better usage of information technology in education. Companies can also play a role in eliminating child labour and increasing access to primary education" (Nelson; Prescott, 2008, p.13).

Sustainability goals

(1) The company improves the qualitfication of its workers at all levels by providing trainings, information campaigns and, if necessary, infrastructure investments in sufficient quality and quantity.
(2) All individuals and teams are equipped with the skills, knowledge and competences they require to undertake current and future tasks required by the organisation.
(3) Personnel are satisfied with the trainings offered by the company.
(4) Adequately educated and skilled persons are available on the labour market.

Indicators and data needs

Goal	Indicator name	What is measured?	Data needs	Minimum requirements
1, 2	**Training quantity**	Quantity of further education	Annual hours of training per employee	Training quantity is equal to the benchmark.
1, 2	**Training participation**	Participatation in trainings	Share of workforce receiving training (e.g. during the last three years) Personnel category	All personnel categories have access to trainings.

3	**Personnel satisfaction**	Satisfaction with personnel training and development	Survey data about satisfaction with quality and quantity of trainings and development offered by the company and other providers.	Not yet determined.

Examples of measures to improve sustainability

- Adopt best practice in human resource development
- Promote training for all personnel categories at all sites of a company
- Promote supportive policies to enable personnel to balance their work, family and learning interests
- Trainings and campaigns targeting community and family members

Definitions

*Personnel**:** All individual men and women directly employed or contracted by a company, including directors, executives, managers, supervisors, and workers (SAI, 2008).*

*Training and development: **"**process of systematically developing work-related knowledge and expertise in people for the purpose of improving performance. Also, training is more likely focused on new employees and those entering new job roles in contrast to long-term development." (Swanson & Holton, 2001).*

Sources of information

4.19 Food and nutrition security (S5)

Relevance of the subject

Food security has been defined as a situation in which "all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (FAO, 2005). Thus, there are four pillars of food security, namely availability, access, stability of supply and utilisation.

The Right to Adequate Food is a human right (Art. 25 of the Universal Declaration of Human Rights – UN, 1948; Art. 11 of the International Covenant on Economic, Social and Cultural Rights – UN, 1996a). States and other institutions have repeatedly underlined their commitment to the worldwide realisation of this right, for example at the 1996 World Food Summit (WFS)[44] and through the adoption of the 'Voluntary Guidelines to support the progressive realization of the right to adequate food in the context of national food security' (FAO, 2005). Following the WFS, the target of halving the proportion of people who suffer from hunger from 1990 until 2015 was included in the Millennium Development Goals (target 1.C[45]).

Despite these strong commitments, almost 1 billion people are currently undernourished, most of them in Sub-Saharan Africa and South Asia. As the world's population continues to rise, it has been forecasted that an additional 1 billion tons per year of cereals and 200 million tons per year of livestock products will be needed by 2050 (FAO, 2011).

Food security is a food access issue as today, the total food calories produced would be sufficient to meet global population demand. Food availability if the future can be increased by enhancing productivity. Care must be taken to give priority to food production where competition for land and other resources by the production of feed, industrial raw materials and biofuels threatens to undermine food security. Increased food production must come along with enhanced and stable access to food to become effective. In this endeavour, fair distribution of resources and infrastructure are two key elements. A neglected yet important aspect is the minimisation of food wastage, as 1.3 billion tons per year, roughly one third of the edible parts of food, get lost or wasted (FAO, 2011b). Examples of industry activities improving food sustainability can be found e.g. in UNGC (2008).

Sustainability goals

(1) Within its sphere of influence, the enterprise/company actively promotes food security in its four dimensions: food availability (i.e. productivity and trade), access to food (i.e. access to productive resources/assets and employment), stability of supply (i.e. resilience to environmental and economic shocks) and food utilization (i.e. healthy diets, safe drinking water, biosafety and waste recycling).

(2) Food sovereignty, i.e. the right to determine own food production and consumption choices, is not compromised within the company's sphere of influence.

(3) Right to food and safety nets in times of crisis

Indicators and data needs

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44 www.fao.org/wfs/index_en.htm

45 www.mdgmonitor.org/goal1.cfm

Goal	Indicator name	What is measured?	Data needs	Minimum requirements
1	**Contribution to enhanced food security**	Share of production sites where operations contribute to the improvement of the economic and physical access of the local population to sufficient, safe and nutritious food	Total number of production sites, location Number of sites for which positive contributions to food security can be demonstrated	In all sites located in food insecure regions, at least first measures to make a positive contribution to food security have been implemented.
1	**Food security due diligence**	Share of significant investments prior to which adequate due diligence to prevent negative impacts on food security was done	Total volume of major investments with potential impact on food security (e.g. construction of new factories) Share of these investments (by volume) prior to which adequate food security due diligence was done	The share of major investments with food security due diligence is equal to the benchmark.
1	**Food security impact rating**	Rating of the company's total direct and indirect impact on global food security	Rating of the net direct and indirect impact of operations on food security at global level	No net negative impact of operations on global food security.

Examples of measures to improve sustainability

Definitions

access to food: "access by individuals to adequate resources (entitlements) for acquiring appropriate foods for a nutritious diet" (FAO, 2006).
entitlements: "the set of all commodity bundles over which a person can establish command given the legal, political, economic and social arrangements of the community in which they live (including traditional rights such as access to common resources" (FAO, 2006).

Sources of information

4.20 Product quality (S6)

Relevance of the subject

- Quality management: Good Manufacturing Practice, Hygiene Plan, HACCP etc.
- % products without artificial ingredients and additives
- toxic compounds, nanotechnology, GMOs and irradiation in products and production progresses
- no noxious residues
- no advertisements targeting children
- comprehensively nutrition-labelled products

For the United Kingdom, it has been estimated that poor diet accounts for a third of all cases of cancer and of cardiovascular diseases, respectively. The cost of diet-related disease to the national health system is in an order of 7 billion £ a year (DEFRA, 2010).

Sustainability goals

(1) The company actively promotes consumer health by averting risk due to potentially harmful substances or processes, and by applying high quality standards with regard to the nutritional value of its products.

Indicators and data needs

Goal	Indicator name	What is measured?	Data needs	Minimum requirements
1	Food quality	Share of products that meet the highest nutritional standards, e.g. low contents of saturated and trans fat, added sugars and added sodium	Total production volume (e.g. in units market value) Production volume of products with very high nutritional quality	Food quality is equal to the sector benchmark.
1	Quality management	Share of production facilities certified by an independent party concerning food safety management (e.g. HACCP, Good Manufacturing Practice)	Total number of production facilities Number of production facilities certified according to HACCP or equivalent systems	The share of certified production facilities is equal to the sector benchmark.
1	Product contamination	Number of incidents of contamination with noxious substances (e.g. fungicide or insecticide residues and their metabolites, mycotoxins)	Number of reported incidents in all production faacilities, at least during the last five years	No incidents.
1	Consumer information	Share of comprehensively labelled food products	Total production volume (e.g. in units market value) Production volume of products for which comprehensive information on their nutritional value is publicly available	The share of comprehensively labelled products is equal to the sector benchmark.

Examples of measures to improve sustainability

Definitions

Sources of information

4.21 Participation (G1)

Relevance of the subject

- development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels (www.wmo.int/pages/prog/hwrp/documents/english/icwedece.html)
- 2011 HDR (UNDP, 2011): Evidence is accumulating that power inequalities, mediated through political institutions, affect environmental outcomes in a range of countries and contexts. This means that poor people and other disadvantaged groups disproportionately suffer the effects of environmental degradation. New analysis for this Report covering some 100 countries confirms that greater equity in power distribution, broadly defined, is positively associated with better environmental outcomes, including better access to water, less land degradation and fewer deaths due to indoor and outdoor air pollution and dirty water, suggesting an important scope for positive synergies. (...) Many problems of resource depletion and environmental stress arise from disparities in economic and political power.
- Personnel participation: High involvement of personnel at all levels in Corporate Governance has been observed to increase job satisfaction and labour motivation, thereby improving enterprise performance. (e.g. Mohr and Zoghi, 2005, Jones et al. 2005, Pil and MacDuffie 1996, Guthrie 2001). Relevant channels include enhanced discretionary effort by employees, improved skills due to significant learning effects, and improved corporate culture (Jones et al. 2005). It further raises legitimacy and authority of the decision making.
- Management of companies involving employee even at management board level largely report positive effects and appreciate employee participation (Victorin 2000).
- In companies there exist many forms of employee participation: e.g. quality circles, feedback, suggestion programs, and task teams.

Sustainability goals

(1) Prior to important decisions, the consent of concerned stakeholders inside and outside the company (particularly local communities) is sought via a formal, transparent consultation process.

Indicators and data needs

Goal	Indicator name	What is measured?	Data needs	Minimum requirements
1	**Personnel participation**	Personnel involvement in Corporate Governance Suggestions per employee Implementation of suggestions Performance of personnel participation	Share of personnel involved in Corporate Government (e.g. information and consultation procedures; financial participation: equity sharing and profit sharing; co-determination: employees' representation on boards of directors and works councils, problem solving teams) Suggestions per employee per year (related to production or work organisation) Share of suggestions implemented	All shares are at least equal to the benchmark. Procedures to collect and implement employee suggestions are in place.

			Survey among personnel: Assessment of performance of personnel involvement	
1	**Shareholder participation**	Shareholder involvement in Corporate Governance Performance of shareholder participation	Share of shareholders involved in Corporate Governance Survey among shareholders: assessment of performance of shareholder participation	All of the shares are at least equal to the benchmark.
1	**Community participation**	Community involvement in Corporate Governance Performance of community involvement programs	Share of communities involved (people concerned may be involved by representatives). Survey among community (authorities): assessment of performance of community participation	All of the shares are at least equal to the benchmark.

Examples of measures to improve sustainability

- Establishment of advisory panels, roundtables, committees, networks, and other forms for participation of community, personnel and further relevant Stakeholders.
- Establishment of grievance procedure for personnel, community, shareholders and further relevant Stakeholders.
- Mechanisms for effective shareholders participation in decisions concerning fundamental corporate changes.

Definitions

- All shareholders obtain relevant and material information on a timely and regular basis
- All shareholders participate effectively in decisions concerning fundamental corporate changes.

Sources of information

- FAO Sustainable agriculture and rural development initiative. People shaping their sustainable futures: www.fao.org/SARD/en/init/964/1602/1578/index.html

4.22 Accountability (G2)

Relevance of the subject

- clear labelling, traceability and segregation of certified products
- annual CSR or similar reporting
- anti-bribery policy and procedures
- due diligence
- „[…] [E]nvironmental impact, corruption and bribery also directly impact human rights, and we consider it critical for companies to take these impacts into account" (BLIHR, w/y).

Sustainability goals

(1) Products are correctly labelled and individually traceable.
(2) The company works against corruption in all its forms, including extortion and bribery.
(3) Fair and transparent grievance processes are accessible to all workers, customers and stakeholders substantially affected by the company's operations.

Indicators and data needs

Goal	Indicator name	What is measured?	Data needs	Minimum requirements
1	**Labelled and traceable products**	Share of products which are correctly labelled, segregated and can be traced back to the origin of the main ingredients	Total amount or value or products Amount or value of products which are labelled and traceable	The share of traceable products is equal to the benchmark.
2	**Anti-bribery and -corruption**	Frequency of cases of bribery and corruption involving the company	Number of reported incidents where the company paid or accepted bribes	No incidents.
3	**Grievance procedures**	Share of workers, customers and other stakeholders with access to fair and transparent grievance procedures	Total workforce Total number of customers Total number of affected stakeholders Respective shares with access to grievance procedures	All workers have access to fair and transparent grievance procedures.
3	**Responsibility**	Frequency of incidents where the company did not assmume responsibility for its actions	Number of reported incidents with significant negative impacts on workers, customers, others Number of incidents responsibility for which was denied by the company	No incidents.

Examples of measures to improve sustainability

Definitions

Sources of information

- Business Leaders Initiative on Human Rights. Essential Steps for Business to Respect Human Rights: www.integrating-humanrights.org/data/fe/file/ES%20final%20for%20web.pdf

4.23 Rule of law (G3)

Relevance of the subject

- land conflicts / legal disputes
- water resources under legal dispute
- biological resources under legal dispute
- incidents of non-compliance with applicable law and regulations; number of fines and penalties
- Access to resources is considered an essential facet (even prerequisite) of the right to food, especially for rural populations. For the rural poor, the 'right to feed oneself in dignity' requires an individual to have access to means of production i.e. land, water, grazing resources, forest resources, fishing rights, subsoil resources, and genetic resources.
- "[…] [B]usinesses must not be complicit in the violation of any of the rights, even rights not typically considered applicable in a business context. Companies can potentially affect all human rights and be complicit in their violation" (BLIHR, w/y).
- „[…] [C]ompanies must comply with applicable local, national and international law, whether or not it is enforced, and respect the principles of relevant international law where local or national law is below or silent on this standard. Where local or national law conflicts with the essential steps set out below, […] businesses should strive to uphold the spirit of internationally recognised human rights while still complying with law" (BLIHR, w/y).

Sustainability goals

(1) The company fully complies with applicable law and regulations and in particular refrains from utilising water, land, biodiversity and other resources that are under legimitate dispute.

Indicators and data needs

Goal	Indicator name	What is measured?	Data needs	Minimum requirements
1	**Infringements of applicable law**	Number of infringements of applicable law	Number of infringements Number and amount of fines and penalties	No infringements.
1	**Share of resources under legitimate dispute**	Share of water, land, biodiversity etc. used in operations that is under legitimate dispute	Amounts of water, land and biodiversity (genetic diversity) used for production Amounts of these resources ownership of which is under legitimate dispute	No use of resources under legitimate dispute.

Examples of measures to improve sustainability

Definitions

Sources of information

- Business Leaders Initiative on Human Rights. Essential Steps for Business to Respect Human Rights: www.integrating-humanrights.org/data/fe/file/ES%20final%20for%20web.pdf
- FAO. 2011. Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests. First Draft. FAO, Rome.

4.24 Fairness (G4)

Relevance of the subject

- Fairness is considered to be one of the principal pillars of good corporate governance.
- Concerns with sustainability and equity are similar in one fundamental sense: both are about distributive justice (UNDP, 2011)
- policy towards SME suppliers (pressure exerted? -> ask SMEs)
- collaboration and sharing of benefit along the chain
- investment agreements that include human rights or environmental clauses; suppliers & contractors with social / ethical / human rights screenings

Sustainability goals

(1) Business behaviour towards suppliers and contractors, customers, shareholders and other stakeholders are transparent and fair.

(2) The company promotes fair sharing of benefit along the chain.

Indicators and data needs

Goal	Indicator name	What is measured?	Data needs	Minimum requirements
1	**Business behaviour towards suppliers and contractors**	Transparency and equality of procurement Business behaviour towards (SME) suppliers	Surveys among suppliers and contractors Number of perceived incidences (e.g. misuse of market position, misuse of confidential information, withholding of relevant information)	No incidences.
1	**Business behaviour towards customers**	Transparency and fairness of business behaviour	Survey among consumer protection organisations Number of perceived incidences (e.g. collusion on pricing, inadequate customer care)	No incidences.
1	**Business behaviour towards shareholders**	Transparency and equality of treatment of all shareholders	Survey among shareholders Number of perceived incidences (e.g. insider trading, withholding of relevant information)	No incidences.
	Corporate Governance towards communities	Transparency and fairness towards communities	Survey among community authorities Number of perceived incidences (e.g. withholding of informations, negligence of responsibility concerning environmental risks, public health and security; use of natural resources)	No incidences.

2	**Benefit sharing**	Development of total directors' remuneration compared to net profit after exceptionals Proportion of lowest to highest remuneration within the company Distribution of benefit along the value chain	Total directors' remuneration Net profit after exceptionals Highest and lowest remuneration	Ratio between highest and lowest remuneration does not exceed 12:1. No increase directors' remuneration compared with net profit.
1, 2	**Ethical trading behaviour**	Share of fair trade products in total revenue Share of suppliers and contractors with social, ethical, and human rights standards Investment agreements that include human rights or environmental clauses	Value of fair trade products Value of products with no additional value Number of suppliers with standards Number of suppliers with no standards Investment volume including clauses Investment volume with no clauses	All of the shares are at least equal to the benchmark.

Examples of measures to improve sustainability

- All shareholders share the profits of the corporation.
- All shareholders obtain relevant and material information on a timely and regular basis.
- Members of the board and key executives should disclose to the board whether they have a material interest in any transaction or matter directly affecting the corporation.
- Transparent information on remuneration policy for members of the board and key executives.
- Full disclosure of financial and non-financial information.

Definitions

Sources of information

- OECD Principles of Good Governance: www.oecd.org/dataoecd/32/18/31557724.pdf
- The Good Corporation Standard 2010: www.goodcorporation.com/good-corporation-standard.php

4.25 Evaluation (G5)

Relevance of the subject

Sustainability goals

(1) Performance is evaluated and improved across all sustainability dimensions, using accepted standards.
(2) Information on the performance of the company in all sustainability dimensions is publicly available in a high quality.
(3) The company periodically monitors, evaluates and improves workers' and consumers' satisfaction.

Indicators and data needs

Goal	Indicator name	What is measured?	Data needs	Minimum requirements
1	**Sustainability dimensions covered by quality management**	Implementation of quality management in the social, governance, environment and economic dimensions	Documentation on participation in ISO 9001, ISO 14001, SA 8000, EMAS and similar systems	At least simple forms of quality management are implemented or planned for all sustainability dimensions
1	**Share of production in certified sites**	Share of production taking place at sites that are certified according to accepted systems	Total volume of production Production taking place at sites certified according to ISO 9001, ISO 14001, SA 8000, EMAS and similar systems Farms: share of farms on which at least a rapid assessment of the social and environmental situation was done	The share of certified production is equal to the benchmark.
1	**Sourcing from certified suppliers**	Share of inputs sourced from suppliers which have passed independent evaluations of social, ethical, human rights or environmental compliance, or of sustainability performance	Total amount or value of inputs Amount or value of inputs sourced from evaluated suppliers	The share of certified supplies equals the benchmark.
2	**Disclosure of performance**	Public availability of information about the company's economic, social and environmental performance (e.g. CSR or CSV reporting)	Thematic scope of reporting – which sustainability categories are covered Quality of reporting – is the published information relevant, up-to-date and performance-related	All sustainability dimensions are covered in reports. The quality of reporting complies with accepted standards.
3	**Monitoring of worker satisfaction**	Monitoring of worker satisfaction	Share of the workforce participating in surveys of worker satisfaction (yearly average)	The share of participating workforce is equal to the benchmark.

3	**Monitoring of consumer satisfaction**	Monitoring of consumer satisfaction	Share of consumers addressed by surveys of consumer satisfaction (yearly average)	The share of addressed consumers is equal to the benchmark.

Examples of measures to improve sustainability

Definitions

Sources of information

Glossary of terms and definitions

auditor = individual or group of individuals, belonging to an organisation itself or a natural or legal person external to that organisation, acting on behalf of that organisation, carrying out an assessment of the sustainability management system in place and determining conformity with the organisation's sustainability policy and programme, including compliance with the applicable legal requirements relating to sustainability (adapted, after EC, 2009).

benchmark = in SAFA, benchmarks are values, with which the company's performance in an indicator domain is compared to facilitate a rating of sustainability performance. Regional and/or sectoral averages, as well as defined 'average' (standard) and 'best practice' values can be used as benchmarks.

carrying capacity = capacity of an ecosystem or of Earth to support a population, determined by the population's needs and the ecosystem's capacity to supply resources and process wastes. For human populations, carrying capacity is also determined by technology and by choices concerning economics, environment, culture and demography (e.g. Cohen, 1995).

consistency check = process of verifying that the assumptions, methodsand data are consistently applied throughout thestudy and are in accordance with the goal andscope definition performed before conclusions arereached (ISO 14040, 2009).

critical review = process intended to ensure consistency between a SAFA study and the principles and requirements of the SAFA Guidelines (adapted after ISO 14040, 2009).

cut-off criteria = specification of the amount of material or energy flow or the level of environmental significance as-sociated with unit processes or product system tobe excluded from a study (ISO 14040, 2009).

food and agriculture systems = in the context of the current Guidelines, systems that serve the production and marketing of goods that originate from agriculture, forestry or fisheries.

food security = when all people, at all times, have physical, social, and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life.

generic = definition in the Oxford Dictionary: "characteristic of or relating to a class or group of things; not specific". Here, we refer to the term's meaning in mathematics, where it denominates properties shared by almost all objects of a certain type. The SAFA Guidelines provide principles, processes and core indicators that should apply to (almost) all sustainability assessments in the food and agriculture sector.

governance = the process of decision-making and the process by which decisions are implemented (UNESCAP, 2009).

impact = primary and secondary long-term effects directly or indirectly produced by an intervention (OECD, 2002).

indicator = quantitative or qualitative factor or variable that provides a simple and reliable means to measure achievement, to reflect the changes connected to an intervention, or to help assess performance (adapted after OECD, 2002).

outcome = likely or achieved short-term and medium-term effects of an intervention's outputs (OECD, 2002).

performance = degree to which an intervention or a partner operates according to specific criteria/standards/guidelines or achieves results in accordance with stated goals or plans (OECD, 2002).

product = any goods or service (ISO 14040, 2009). For the purpose of SAFA: goods based on materials produced through agricultural, forestry or fisheries activities.

site = distinct geographic location under the management control of an organisation covering activities, products and services, including all infrastructure, equipment and materials (EC, 2009).

sustainable management = environmental and social management and corporate governance, in conjunction with financial management. Processes or structures that an organisation uses to meet its sustainability goals and objectives while transforming inputs into a product or service (modified after UNEPFI, 2006).

sustainable = relating to or designating forms of human activity that enhance economic resilience, equitably promote human rights and well-being – including global food security – and protect and enhance the natural resource base and ecosystem functions.

sustainable agriculture and rural development (SARD) = management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. Such sustainable development (in the agriculture, forestry, and fisheries sectors) conserves land, water, plant and animal genetic resources, is environmentally non-degrading, technically appropriate, economically viable and socially acceptable (FAO, 1989).

sustainable development = development is considered sustainable when all are today able to secure their livelihood, in ways which are compatible with the maintenance of the environment and of natural resources, thus assuring the ability of future generations to secure their needs from the same natural resource base. Developmental processes that preserve human, social, economic, and environmental resources are evaluated in relation to values, power relationships, time, and space. Interactions between resources, and their relative substitutability, lead to inevitable trade-offs between them.

value chain = a mechanism that allows producers, processors, buyers, and sellers—separated by time and space—to gradually add value to products and services as they pass from one link in the chain to the next till reaching the final consumer. Main actors in a value chain are suppliers, producers, processors, marketers and buyers from the private sector. They are supported by a range of private and public technical, business and financial service providers. In a value chain the various business activities in the different segments become connected and to some degree coordinated (UNIDO, 2011).

well-being = the state of being or doing well in life; healthy, or prosperous condition; moral or physical welfare (of a person or community).

References

4C Association. 2009. The 4C Code of Conduct. Common Code for the Coffee Community Association. www.4c-coffeeassociation.org/downloads/about4c/4CDoc_001a_CodeofConduct_v1.2_en.pdf

Al-Tuwaijri S, et al. 2008. Beyond death and injuries: The ILO's role in promoting safe and healthy jobs. XVIII World Congress on Safety and Health at Work, June 2008, Seoul, Korea – Introductory report. International Labour Office, Geneva.

BGR. 2006. Deutsche Bundesanstalt für Geowissenschaften und Rohstoffe. Jahresbericht 2006 (in German). Hanover, Germany.

BLIHR. 2009. Policy Report 4. Business Leaders Initiative on Human Rights. Available online at www.blihr.org/Legacy/Downloads/BLIHR Report 2009.pdf

Blumenthal U, Peasey A. 2002. Critical review of epidemiological evidence of the health effects of wastewater and excreta use in agriculture. Unpublished document prepared for WHO (available upon request), World Health Organization, Geneva.

Breitschuh G, Eckert H, Matthes I, Strümpfel J, Bachmann G, Breitschuh T. 2008. Kriteriensystem nachhaltige Landwirtschaft (KSNL) (in German). KTBL-Schrift 466. Kuratorium Technik und Bauwesen in der Landwirtschaft e.V., Darmstadt, Germany.

BSCI. 2009. Code of Conduct. Business Social Compliance Initiative. Foreign Trade Initiative, Brussels. Available online at www.bsci-intl.org/resources/code-of-conduct

Burton J. 2010. World Health Organization Healthy Workplace Framework and Model: Background and supporting literature and practices. WHO, Geneva. Available online at http://www.who.int/occupational_health/healthy_workplaces_background_original.pdf

Cohen, JE. 1995. Population growth and Earth's human carrying capacity. Science 269: 341-346.

Daly, HE. 1990. Toward some operational principles of sustainable development. Ecological Economics 2: 1-6.

DEFRA. 2010. Food 2030. Department for Environment, Food and Rural Affairs, London. Available online at http://archive.defra.gov.uk/foodfarm/food/pdf/food2030strategy.pdf

Doane D, MacGillivray A. 2001. Economic Sustainability. The business of staying in business. New Economics Foundation, London. Available online at http://projectsigma.co.uk/RnDStreams/RD_economic_sustain.pdf

EC. 2009. Regulation (EC) No 1221/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS). European Council, Brussels. Available online at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:342:0001:01:EN:HTML

EC (2010): Agriculture and climate change. European Commission. http://ec.europa.eu/agriculture/climate_change/index_en.htm [09.12.2010]

European Soil Charter. 1972. Council of Europe. Committee of Ministers. wcd.coe.int/wcd/com.instranet.InstraServlet?command=com.instranet.CmdBlobGet&InstranetImage=588295&SecMode=1&DocId=644074&Usage=2

EWCS. 2007. Fourth European Working Conditions Survey. (European Foundation for the Improvement of Living and Working Conditions) (Ed.), Luxemburg. Available online at http://www.eurofound.europa.eu/pubdocs/2006/98/en/2/ef0698en.pdf

Fairtrade International. 2011a. Generic Fairtrade Trade Standard. Fairtrade Labelling Organizations International e.V., Bonn, Germany. www.fairtrade.net/standards.0.html

Fairtrade International. 2011b. Generic Fairtrade Standard for Contract Production. Fairtrade Labelling Organizations International e.V., Bonn, Germany. www.fairtrade.net/standards.0.html

Fairtrade International. 2011c. Generic Fairtrade Standard for Hired Labour. Fairtrade Labelling Organizations International e.V., Bonn, Germany. www.fairtrade.net/standards.0.html

Fairtrade International. 2011d. Generic Fairtrade Standard for Small Producer Organizations. Fairtrade Labelling Organizations International e.V., Bonn, Germany. www.fairtrade.net/standards.0.html

Falkenmark M. 1997. Meeting Water Requirements of an Expanding World Population. In DJ Greenland, PJ Gregory, PH Nye: Land Resources: On the Edge of the Malthusian Precipice? CAB International, Wallingford, UK.

FAO. 2005. Voluntary Guidelines to support the progressive realization of the right to adequate food in the context of national food security. Food and Agriculture Organization of the United Nations, Rome. Available online at www.fao.org/docrep/meeting/009/y9825e/y9825e00.htm

FAO. 2010. State of Food Insecurity in the World. 2010 Report. Food and Agriculture Organization of the United Nations, Rome. www.fao.org/publications/sofi/en

FAO. 2011a. The State of the World's Land and Water Resources for Food and Agriculture. Managing systems at risk. Food and Agriculture Organization of the United Nations, Rome. Available online at www.fao.org/nr/solaw/solaw-home/en

FAO. 2011b. Global Food Losses and Food Waste. Extent, causes and prevention. Food and Agriculture Organization of the United Nations, Rome. Available online at www.fao.org/fileadmin/user_upload/ags/publications/GFL_web.pdf
FAOSTAT. 2011. FAOSTAT-Agriculture Database. Available online at http://faostat.fao.org/default.aspx
FSC. 1996. FSC International Standard. FSC Principles and Criteria for Forest Stewardship. Forest Stewardship Council A.C., Bonn, Germany. Available online at www.fsc.org/fileadmin/web-data/public/document_center/international_FSC_policies/standards/FSC_STD_01_001_V4_0_EN_FSC_Principles_and_Criteria.pdf
GlobalG.A.P. 2011a. Control points and compliance criteria. Integrated farm assurance. All farm base. Version 4.0. GlobalG.A.P. c/o FoodPlus GmbH, Cologne. www.globalgap.org/cms/front_content.php?idcat=3
GlobalG.A.P. 2011b. Control points and compliance criteria. Integrated farm assurance. Crops base. Version 4.0. GlobalG.A.P. c/o FoodPlus GmbH, Cologne. www.globalgap.org/cms/front_content.php?idcat=3
GlobalG.A.P. 2011c. Control points and compliance criteria. Integrated farm assurance. Livestock base. Version 4.0. GlobalG.A.P. c/o FoodPlus GmbH, Cologne. www.globalgap.org/cms/front_content.php?idcat=3
Good Corporation. 2010. The Good Corporation Standard (revised July, 2010). Available online at www.goodcorporation.com/good-corporation-standard.php
GRI. 2011a. Sustainability Reporting Guidelines. Version 3.1. Global Reporting Initiative, Amsterdam. www.globalreporting.org/ReportingFramework/G31Guidelines
GRI. 2011b. Sustainability Reporting Guidelines. Version 3.1. Food Processing Sector Supplement. Global Reporting Initiative, Amsterdam. www.globalreporting.org/ReportingFramework/SectorSupplements/FoodProcessing
Grenz J, Thalmann C, Schoch M, Stämpfli A. 2011. RISE 2.0 Field Manual. Swiss College of Agriculture, Zollikofen, Switzerland.
IFOAM. 2007. The IFOAM Basic Standards for Organic Production and Processing (version 2005). IFOAM, Bonn, Germany. www.ifoam.org/about_ifoam/standards/norms.html
IISD. 2009. Bellagio STAMP: SusTainability Assessment and Measurement Principles. International Institute for Sustainable Development, Winnipeg.
ILO. no year. ILO Core Conventions. International Labour Organization, Geneva. www.labourstart.org/rights
ISEAL Alliance. 2010. Assessing the impacts of environmental and social standards systems. ISEAL Code of Good Practice, version 1.0. ISEAL Alliance, London. Available online at www.isealalliance.org/resources/p041-impacts-code-of-good-practice
ISO 14025. 2006. Environmental labels and declarations – Type III environmental declarations – principles and procedures. International Organization for Standardization, Geneva.
ISO 14040. 2009. Environmental management – Life cycle assessment – Principles and framework (ISO 14040:2006). German and English version, November 2009. Deutsches Institut für Normung e.V., Berlin.
IWMI. 2006. Insights from the Comprehensive Assessment of Water Management in Agriculture. International Water Management Institute, Colombo, Sri Lanka.
Jörissen J, Kopfmüller J, Brandl V. 1999. Ein integratives Konzept nachhaltiger Entwicklung (in German). Wissenschaftliche Berichte FZKA 6393. Forschungszentrum Karlsruhe, Germany.
MEA. 2005. Millennium Ecosystem Assessment. Ecosystems and Human Well-being: Synthesis. Available online at www.maweb.org/en/index.aspx
Nelson J, Prescott D. 2008. Business and the Millennium Development Goals: A Framework for Action (2nd edition). Available online at www-dev.iblf.org/docs/BMDG_final_w.pdf
OECD. 2002. Glossary of key terms in evaluation and results based management. Organisation for Economic Co-Operation and Development, Paris.
OECD. 2003. OECD Environmental Indicators. Development, measurement and use. Reference paper. Organisation for Economic Co-Operation and Development, Paris. www.oecd.org/document/28/0,3746,en_2649_33793_39681244_1_1_1_1,00.html
OECD. 2004. Principles of Good Corporate Governance. OECD, Paris.
OECD/IEA, 2008. Towards a sustainable energy future. International Energy Agency, Paris. www.iea.org/G8/2008/G8_Towards_Sustainable_Future.pdf
Oldeman LR, Hakkeling RTA, Sombrock WG. 1991. Global Assessment of Soil Degradation - GLASOD. World map of the status of human-induced soil degradation. ISRIC, Wageningen and UNEP, Nairobi.
Pfister S, Koehler A, Hellweg S. 2009. Assessing the Environmental Impacts of Freshwater Consumption in LCA. Environ. Sci. Technol., 43: 4098-4104.
Popper K. 1935. Logik der Forschung. Wien.

Porter, T. 2008. Managerial applications of corporate social responsibility and systems thinking for achieving sustainability outcomes. Systems Research and Behavioral Science 25: 397-411.
Rockström et al., 2009. A safe operating space for humanity. Nature 461: 472-475.
RSB. 2010. RSB Principles & Criteria for Sustainable Biofuel Production. Roundtable on Sustainable Biofuels, Lausanne. http://rsb.epfl.ch/page-67254-en.html
RSB. 2011a. RSB Conservation Impact Assessment Guidelines. Roundtable on Sustainable Biofuels, Lausanne. http://rsb.epfl.ch/page-67254-en.html
RSB. 2011b. RSB Social Impact Assessment (SIA) Guidelines. Roundtable on Sustainable Biofuels, Lausanne. http://rsb.epfl.ch/page-67254-en.html
SAI. 2008. Social accountability 8000. SAI Standard SA8000. Social Accountability International.

SAI Platform. 2009. Agriculture standards benchmark study. Sustainable Agriculture Initiative Platform, Brussels. www.saiplatform.org/activities/alias/sustainability-indicators
Salomone R. 2003. Life cycle assessment applied to coffee production: investigating environmental impacts to aid decision making for improvements at company level. Food, Agriculture & Environment 1: 295-300.
SAM. 2011. SAM Research Corporate Sustainability Assessment Questionnaire. SAM Group Holding AG, Zürich. Available online at www.sam-group.com/images/sample-questionnaire_tcm794-267819.pdf
SAN. 2010a. Sustainable Agriculture Standard. Sustainable Agriculture Network. San José, Costa Rica. http://sanstandards.org/sitio
SAN. 2010b. Standard for Sustainable Cattle Production Systems. Sustainable Agriculture Network. San José, Costa Rica. http://sanstandards.org/sitio
SAN. 2011a. Group Certification Standard (version 2). Sustainable Agriculture Network. San José, Costa Rica. http://sanstandards.org/sitio
SAN. 2011b. SAN Climate Module. Criteria for mitigation and adaptation to climate change. Sustainable Agriculture Network. San José, Costa Rica. http://sanstandards.org/sitio
Scheffer F, Schachtschabel P, et al. 1989. Lehrbuch der Bodenkunde (in German; 12th edition). Ferdinand Enke Verlag, Stuttgart.
Sedex. no year. Sedex Self-Assessment Questionnaire. (confidential). Sedex Information Exchange, London.
Swanson RA. 1996. Training for Performance System: Field Handbook. Swanson & Associates, St. Paul, MN.
Swanson RA, Holton EF. 2001. Foundations of human resource development. San Francisco: Berrett-Koehler. Available online at: tum.mgt.psu.ac.th/project/e_library/Library/bookpdf/FoundationsofHRM.pdf
Toscano G. 1997. Brief: Dangerous jobs. In Bureau of Labor Statistics. Compensation and Working Conditions, Summer, 57–60.
UN. 1948. Universal Declaration of Human Rights. United Nations Organization, New York.
UN. 1966a. International Covenant on Economic, Social and Cultural Rights. United Nations Organization, New York.
UN. 1966b. International Covenant on Civil and Political Rights. United Nations Organization, New York.
UN. 1979. Convention on the on the Elimination of All Forms of Discrimination Against Women (CEDAW). United Nations, New York.
UN. 2007. Indicators of Sustainable Development: Guidelines and Methodologies – Third edition. Methodology sheets. United Nations Publications, New York. www.un.org/esa/sustdev/natlinfo/indicators/guidelines.pdf
UN. 2011. The Millennium Development Goals Report 2011. United Nations, New York. www.un.org/millenniumgoals/11_MDG Report_EN.pdf
UNEP. 2010. Green Economy. Developing Countries Success Stories. United Nations Environment Programme, Geneva.
UNEP. 2011. Towards a Green Economy. Pathways to sustainable development and poverty eradication. United Nations Environment Programme. Available online at www.unep.org/greeneconomy
UNEPFI. 2006. Sustainability management and reporting. Benefits for financial institutions in developing and emerging economies. UNEP Finance Initiative Sustainability Management and Reporting Project. UNEP, Geneva.
UNESCAP. 2009. What is Good Governance? United Nations Economic and Social Commission for Asia and the Pacific, Bangkok.
UNESCO. 2003. 1st UN World Water Development Report: Water for People, Water for Life. Paris, New York and Oxford. UNESCO (United Nations Educational, Scientific and Cultural Organization) and Berghahn Books.
UNESCO. 2009. Water in a Changing World. The United Nations World Water Development Report 3. UJESCO Publishing, Paris, and Earthscan, London. Available online at www.unesco.org/water/wwap/wwdr/wwdr3/pdf/WWDR3_Water_in_a_Changing_World.pdf
UNGC. 2008. Food sustainability. A guide to private sector action. United Nations Global Compact. Available online at www.unglobalcompact.org/docs/news_events/9.1_news_archives/2008_09_24/food_sustainability.pdf

UNGC. 2010. United Nations Global Compact Management Model. Framework for Implementation. United Nations, New York. Available online at www.unglobalcompact.org/docs/news_events/9.1_news_archives/2010_06_17/UN_Global_Compact_Management_Model.pdf

UNGC & BSR. 2010. Supply Chain Sustainability. A practical guide for continuous improvement. Available online at www.unglobalcompact.org/docs/issues_doc/supply_chain/SupplyChainRep_spread.pdf

UNGC/IFC. 2009. Corporate Governance. The foundation for corporate citizenship and sustainable business. United Nations Global Compact / International Finance Corporation. New York & Washington D.C. Available online at www.unglobalcompact.org/docs/issues_doc/Corporate_Governance/Corporate_Governance_IFC_UNGC.pdf

UNIDO. 2011. Industrial Value Chain Diagnostics: An Integrated Tool. United Nations Industrial Development Organization (UNIDO). Vienna, Austria.

Unilever. 2010. Unilever Sustainable Agriculture Code. www.sustainable-living.unilever.com/wp-content/uploads/2010/12/SustainableAgrCode2010UL.pdf

van der Ploeg RR, Ehlers W, Horn R. 2006. Schwerlast auf dem Acker (in German). Spektrum der Wissenschaft, August 2006.

Von Wirén-Lehr S. 2001. Sustainability in agriculture – an evaluation of principal goal-oriented concepts to close the gap between theory and practice. Agriculture, Ecosystems and Environment 84: 115-129

Wackernagel M, Rees W. 1997. Unser ökologischer Fussabdruck: Wie der Mensch Einfluss auf die Umwelt nimmt (in German). Birkhäuser, Basel/Boston/Berlin.

Wal-Mart. no year. Wal-Mart Supplier Sustainability Assessment. Available online at http://walmartstores.com/Sustainability/9292.aspx

WBCSD. 2000. Eco-efficiency. Creating more value with less impact. World Business Council for Sustainable Development, Geneva. Available online at www.wbcsd.org/web/publications/eco_efficiency_creating_more_value.pdf

WCED. 1987. Report of the World Commission on Environment and Development: Our common future. Available online at www.un-documents.net/wced-ocf.htm

WEF. 2010. Realizing a New Vision for Agriculture. A roadmap for stakeholders. World Economic Forum. Available online at www3.weforum.org/docs/IP/AM11/CO/WEF_AgricultureNewVision_Roadmap_2011.pdf

WHO. 2006. Air Quality Guidelines. Global update 2005. World Health Organization, Regional Office for Europe. Copenhagen. Available online at www.euro.who.int/__data/assets/pdf_file/0005/78638/E90038.pdf

World Bank. 2011. World dataBank. World Development Indicators (WDI) & Global Development Finance (GDF). World Bank, Washington D.C.. Available online at databank.worldbank.org/ddp/home.do?Step=12&id=4&CNO=2

WWF Schweiz, Konsumentenschutz, Schweizerischer Tierschutz. 2010. Hintergrundbericht Labels für Lebensmittel (in German). Available online at www.wwf.ch/de/tun/tipps_fur_den_alltag/essend/labels/ratgeber.cfm

In addition, the following approaches, as well as the standards, indicator sets etc. of the following companies and institutions were taken into account (albeit in a less intensive manner than the above sources): MOTIFS, KSNL, REPRO, IDEA, Agenda 21, Sustainable Society Foundation, GreenBiz Index, Utz Kapeh, Roundtable on Sustainable Palm Oil, Forestry Stewardship Council, Kraft, Sainsbury's, Tesco, Barilla, Danone, PepsiCo, Tyson, Marks and Spencer, Carrefour, Coop, Auchan, SunOpta, Kellogg, Heinz, Rewe, Mars.

Annex A

Draft Form for a SAFA description (see section 3.6.8)

General questions

A1 Company name	
A2 Whole company covered by the SAFA?	A2.1 ☐ Yes ☐ No A2.2 If not, what branches are covered?
A3 Industry sectors concerned	
A4 Geographical regions concerned	
A5 Total number of employees in these branches	
A6 Total annual turnover of these branches	
A7 Purpose of the SAFA	☐ As initial self-evaluation ☐ As regular part of sustainability managment ☐ For B2B relations ☐ For B2C relations ☐ Compliance with public or private regulations
A8 Material scope of the SAFA	

A8.1 Delineation of sphere of influence	
A8.2 Delineation of sphere of sustainability impact	
A8.3 Inclusion of suppliers	
A9 Stakeholder participation in the SAFA	
A10 Who did the assessment?	
A11 Has a critical review been undertaken?	A11.1 ☐ Yes ☐ No A11.2 If yes, by whom?

Indicator-specific questions (example)

Sustainability issue included in the SAFA?	☐ Yes ☐ No If not, for what reasons?
Indicators used (a)	

Name	Unit	Data source(s)	Data used from other audits	Minimum sustainability treshold	Valuation function[46]

46 For example: linear, inverse quadratic, sigmoid, hyperbolic, table lookup with linear interpolation (see Fig. 3)

Indicators used (b)

Name	Regional adaptations	Sectoral adaptations	Spatial scope	Temporal scope

Annex B

Applying the SAFA Guidelines – the fictitious case of XYZ S.A.

Background

XYZ S.A. is a medium-size company active in the fruit business, located in the South of Mexico. The company sources citrus fruit from several hundred farms in a radius of 150 km around its main factory. In the factory, fruits are sorted, treated and packaged. Then they are marketed nationally and internationally. The XYZ S.A. has introduced professional quality management several years ago and is certified according to e.g. the international HACCP standard (ISO 22000 FSMS 2005) and GlobalG.A.P.. Hence, the company also employs a quality management team.

Since a few years, the company is subject to increasing pressure from buyers, particularly overseas, to provide data on its social and environmental performance. For example, data on water use in the factory and on pesticide use on the citrus farms were demanded. In addition, a recently hired new manager has raised the issue of "green profits", i.e. the idea of positioning XYZ S.A. as a "green" or "sustainable" fruit company.

In this situation, the board is informed about the availability of guidelines to be used for checking the overall sustainability of value chains, provided for free by FAO. After checking back with overseas buyers and learning that they accept sustainability assessments based on the SAFA Guidelines as a source of information, it is decided to conduct a first self-assessment and charge the quality management section with the task. While not being happy about the apparent additional workload, quality managers get down to work.

SAFA Step 1: Goal and scope definition

According to the SAFA Guidelines, the first step of an assessment is to define its goal and scope. After discussing this issue with the board, the quality managers define the assessment goal should be the identification of "hot spots of sustainability performance" of XYZ S.A.. The scope of the analysis includes the factory as well as all farms delivering fruit to the company; input suppliers to farms are excluded, but might be included in later assessments. From the several hundred suppliers, 20 farms representing different regions and farm sizes are chosen. The critical review of the self-assessment will be done internally.

For each sustainability category in the SAFA Guidelines, except the "Animals" category, at least one indicator is chosen. Data availability and relevance are the main selection criteria used. Threshold values separating the sustainability performance classes of the SAFA

Guidelines from each other are partly derived from those used by another Mexican company and published in the publicly available SAFA database. Some values have to be newly defined – at this stage, some support is provided by staff of a local university, e.g. concerning the definition of an indicator and threshold values for the biodiversity conservation area. Benchmark values for energy, water and material efficiency are derived from information available on other fruit companies located in Asia and in southern Europe.

SAFA Step 2: Data collection

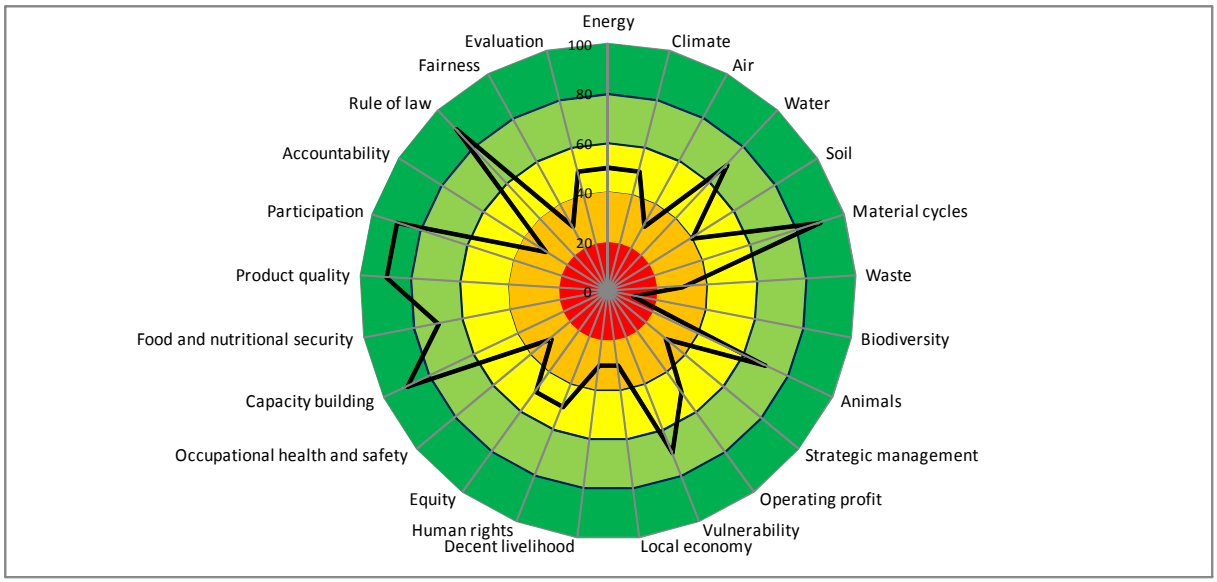
The company's documentation is screened for documents that could provide input to the assessment. This brings about some dispute with the accounting department who would only provide precise figures and (anonymised) copies e.g. of payslips after an intervention of the board. The documentation produced for HACCP and GlobalG.A.P. certification, as well as invoices of fuel and packaging material suppliers and electricity bills are also used as data sources. Biodiversity around the factory and on some supplying farms, waste treatment and possible safety concerns in the factory are assessed on the ground. External analyses of water and air quality close to the factory are commissioned.

A ten-page farmer questionnaire is developed and tested on two farms. After some modifications, including the transformation of some quantitative into qualitative questions (e.g. on measures taken to save water and to implement biological disease control) the questionnaire is handed out to field staff (normally charged with extension work and quality controls), who then collect data on the 20 selected farms. Most farmers are initially reluctant to participate and only do so due to the often long-standing working relation with XYZ field staff. However, after some weeks, requests are received from other farmers who have heard about the exercise and feel the selected farms are awarded a privilege they also would like to have.

An internal survey among factory staff is done as well, to find out about governance and social sustainability issues, e.g. further education, occupational health and participation.

SAFA Step 3: Data analysis

After three months, data collection is completed. One of the company's controllers is charged with checking data for plausibility. It turns out that both factory and farm data include a number of inaccuracies and erroneous information. Completing and correcting the data takes another two weeks. The finalised data are entered into a spreadsheet that is also used for performance valuation and visualisation.



The overall result for the factory is visualised in the figure above. A separate polygon shows the average scores of the visited farms.

SAFA Step 4: Interpretation

Based on the defined goal of the assessment, the interpretation of results is focused on sustainability hot spots, i.e. issues that appear particularly problematic ("sustainability risks"). The company's scope of action for improving performance in the respective category is a further criterion.

Some examples of the identified sustainability hot spots:

- Part of the machinery in the factory, particularly the cooling equipment, is old and thus not very energy-efficient. As a result, and since most electricity in Mexico is fossile-based, the factory's greenhouse gas balance (per unit produce) is very negative.
- Despite the factory's being located in a region with a medium level of water stress, particularly during the winter months, no measures have been taken to use less freshwater and recycle more wastewater. For the future, severe water stress is predicted.
- The operations of part of the citrus farms are rated vulnerable, since they largely rely on income from a single source, namely fruit production. On the other hand, some farms have managed to establish mixed stands of various fruit trees, sometimes combined with extensive cattle grazing. These farms might serve as models to others.
- A large gender-based wage differential discriminates against female workers.
- Decision processes at XYZ S.A. are not very participative. Even at a high level of technical detail, decisions are taken either by the board or by the plant manager. No

incentives are provided for ideas and improvement suggestions by factory staff, let alone by farmers.

Areas with high sustainability performance for example include the cycling of materials, since few non-renewable materials are used in production, and substantial investment into capacity building (extension service for citrus farmers, courses on occupational health and safety for workers).

SAFA Step 5: Reporting and critical review

The results of the sustainability assessment are discussed by the board. It is then decided that this information can be shared internally and – with the exception of some business-related information – with buyers. A bulletin is distributed among workers that explains the motivation and results of the assessment, informs on intended improvements regarding e.g. energy efficiency and calls upon all employees to contribute ideas for a further improvement of sustainability performance.

Buyers react positively to the pro-active approach of XYZ S.A.. One customer now considers sourcing more fruit from the company.