

Sustainability Assessment of Food and Agriculture Systems: Outcome of the Electronic Consultation Held by FAO from 21 February to 25 March 2011

1. Introduction

The ecological, economic and social principles of “sustainable development” received 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. Recent years have seen the development of frameworks, standards and indicators for assessing the environmental and social impacts of production of various sectors, including the agriculture and food sectors, at different scales. Many companies in the food industry have adopted the concept of corporate responsibility reporting. Methods to quantify environmental impacts of products and services, or to assess compliance with social standards, are widely used as well. For the farm level, several sustainability evaluation methods have been developed.

However, **no international benchmark defines what ‘sustainable food production’ actually entails.** More generally, there is no commonly accepted set of indicators to measure sustainability performance. With a view to offer a fair playing field, FAO wishes to build on existing efforts and develop a Sustainability Framework as part of its efforts for the 2012 United Nations Conference on Sustainable Development (UNCSD). The intent is to develop guidelines that are to serve as a template for food chain sustainability assessment, for the use by food manufacturers and retailers who wish to substantiate sustainability claims. Ultimately, a tool for the **Sustainability Assessment of Food and Agriculture systems (SAFA)** will be developed for companies, according to their prevailing needs.

For a start, FAO cooperated with ISEAL for developing such a Sustainability Framework that mapped on-going initiatives and indicators and an expert meeting, held in September 2009, helped identifying core sustainability issues from an environmental, social, economic and governance perspective. Broader stakeholders’ views were subsequently 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 goals and scope, derived from a review of social and environmental standards and corporate responsibility reports of food chain actors, 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. Weekly summaries of the discussion were made available on the website.

2. Draft SAFA goals, scope and indicators

This outline of the envisaged SAFA reflects our state of knowledge at the beginning of the E-Forum.

Vision

Our vision is to contribute to the sustainable development of agricultural systems and food chains and the entities involved in them; that is, a development that is environmentally benign, socially just and economically viable through good governance.

Goals and Approach

The main goal is to contribute to achieving the vision through the development of Guidelines and methodology for the **Sustainability Assessment of Food and Agriculture Systems (SAFA)**. The Guidelines shall be promoted as a science-based generic template for any assessment whereby a company or production site claims to be sustainable. They shall be used by food manufacturers and retailers, primarily for management and business-to-business (B2B) communication purposes. SAFA will be developed based on a set of indicators and coefficients. Its technical implementation, according to exact coefficients and algorithms, will be left to the stakeholders. Complexity and scale of the SAFA must not be prohibitive to small and medium enterprises, nor to stakeholders from developing countries.

Scope

SAFA seeks to involve all actors along the food chain, from farming systems to final commodity sales, including all entities that generate significant sustainability impacts (actual and potential) and/or over which the reporting organization exerts control or significant influence regarding financial and operating policies and practices¹. Impacts on economic, environmental, social and governance sustainability would be assessed. The temporal scope of SAFA shall be the most recent year for which all core data are available. For some indicators (e.g. greenhouse gas emissions), several years must be considered to identify trends. Spatial coverage extends to all production facilities and their immediate surroundings, insofar as the entities involved in the food chain directly (e.g. warehouses, fleet, shops) or indirectly (e.g. farms producing for a specific supplier) control the utilization of these areas.

Based on a review of standards and methods, on expert meetings and a review of corporate responsibility reports of dozens of food companies and retailers, four pillars are considered relevant in creating the necessary framework conditions for a sustainable development, namely Environmental Integrity, Economic Resilience, Social Well-Being and Good Governance. The following core issues are proposed:

CORE ISSUE	EXPLANATION
Environmental Integrity	
Water	Water quantity and quality
Biodiversity & Ecosystems	Diversity of life at the level of species, genetic diversity and ecosystems
Land & Soil	Maintenance and enhancement of organic matter, as well as conserving soil from erosion and degradation
Air & Climate	Mitigation of greenhouse gas emissions and reducing ozone depleting substances
Economic Resilience	
Secure Livelihoods	Enhancing capabilities, assets, and activities required for a means of living
Resilience to Economic Risk	The assurance of self-reliance, and the ability to counter risk through economic diversification and access to finance
Sustainable Production	The production and use of goods and services that minimize the use of natural resources, toxic materials and emissions over the unit life cycle
Social Well-Being	
Labor Rights	The range of rights enshrined in the ILO Declaration on Fundamental Principles and Rights at Work
Non-discrimination & Equity	Equal access to opportunities and empowerment of women, reduction of discrimination and inequalities
Education	Access to, engagement in and attainment through education, knowledge sharing and awareness raising

¹ Scoping principle adopted from the Global Reporting Initiatives' (GRI) G3.1 Guidelines (www.globalreporting.org).

Health & Safety	Providing access to medical treatment, nutritional products and safe working conditions
Social Commitment	Acting actively to benefit society at large
Good Governance	
Accountability	Commitment to respond to and balance the needs of stakeholders in decision-making processes and activities, and deliver against this commitment
Rule of Law	Adherence to rules-based approaches

3. Summary of Forum Contributions

3.1 Affirmation of Need

The E-Forum revealed a strong agreement among participants with regards the need for a science- and evidence-based **sustainability framework and tool, which was reported to be very useful and indeed timely**. The main arguments were that it was necessary for consumers to have a reliable tool, which orientates them among the numerous quality labels. Furthermore, it was confirmed that communication via a market tool could actually move consumers towards “sustainability”. It was mentioned that it is not enough to measure the impact of the agricultural sector alone on natural resources and climate, but that all processes in the chain (transport, storage, processing, etc.) are relevant. The lengthening of the food chain itself – as was stated by one participant – is giving rise to the sustainability question in global food production and consumption system.

At least one participant expressed criticism about the indicator approach, arguing that sustainable development could be understood as a development path taken, or imposed upon, by food chain actors, lacking bottom-up analysis and initiatives. Another participant raised the issue that SAFA should **not add complexity to a market already full of regulations and standards**. Rather than listing ‘good’ and ‘bad’ practices and technologies, it was agreed that the **indicator list should be adaptable to local conditions, science-based and seeking to achieve progress towards sustainability** (continuous improvement).

Some further aspects that were highlighted regarding the usefulness of the prospective tool include:

- aligning efforts in order to avoid duplicating common frameworks;
- developing a practical tool with precaution (since the term “sustainability” became so overused);
- first settling the theoretical basis of sustainability upon which the framework will rest;
- collecting up-to-date data from all stakeholders.

One participant recommended to **be very clear about the goal and scale levels** of the Framework, since no single set of indicators could cover all possible stakeholders, steps of the chain and goals. The generic standards would also need to be locally adapted to be truly relevant for producers around the world. **In refining general principles, sustainability issues, criteria for indicator development etc., companies have to be strongly involved**; the Global Reporting Initiative (GRI) was cited as a successful example. It was suggested that, following the identification of relevant indicators, the definition of minimum (or optimum) criteria for a sustainable food chain de clarified. The main challenge indeed lies in harmonizing stakeholder opinions on how to calculate and value the different scores and thresholds.

With regards the definition and dimensions of sustainability, several participants agreed that the term “sustainability” itself is a normative one and is connected with beliefs, attitudes and relationship to nature. Whereas the need exists to have a theoretical discussion on the human-nature relationships and their impact on sustainability, participants seem to accept that the **SAFA would rather follow the practical approach focusing on indicators and their metrics**. It was stated by one participant that an agreement on the question

of what to measure (the indicators and their metric) would be more important than a near-term consensus on how and where to measure.

The four-pillar concept of sustainability stimulated some discussion. One participant suggested the replacement of the four pillars with expanding circles that represent “natural resources” and “ecosystems” in the middle and “society” as the outer circle. Accountability was mentioned twice as being crucial for the reliability and credibility of the assessment. It was suggested to mention not (only) the technical term “accountability” but also the word “democracy”. The suggestion was made to rephrase the word “sustainable” in the core issue “sustainable production” and to list the indicators related to transport, waste and energy under the environmental pillar, rather under the economic pillar. The economic pillar was highlighted as being a crucial one if not the most important, given that activities along the chain are business cases.

Several participants agreed that **the amount of data that need to be collected for the assessment shall be kept at a minimum level**, given the fact that a regular monitoring over time would be needed. If too much effort has to go into data collection, less will be available for actually improving practices. It was stated that economic operators should have key data available – which should be drawn upon – and that in case of missing information, default data could be derived, for example. from the GEMIS emissions database. Detailed knowledge about **possibilities to assemble data at reasonable cost** will be crucial.

We received some suggestions on further aspects to be considered for the inclusion on the indicator list, including:

- measurement and mitigation of greed;
- measurement of collaboration and the sharing of economic benefits along the value chain;
- protection of interests of farmers and consumers;
- measurement of the extent to which food systems are cyclic in nature and scope - with the basic assumption that shortened supply chains are more efficient in terms of energy, creation of waste and externalities (an assumption requiring further scrutiny).

Reference was made to the following resources, approaches and methodologies:

- Participatory Agricultural Chain Assessment (PACA, <http://veco.vredeseilanden.org/en/sacd/paca>);
- EcoCommerce (as illustrated one the EcoCommerce 101 website, www.ecocommerce101.com);
- Product Life Cycle resp. Industrial Metabolism approach;
- Stewardship Index for Specialty Crops (SISC, www.stewardshipindex.org);
- Committee on Sustainable Assessment (COSA, <http://sustainablecommodities.org/cosa>);
- Global Emission Model for Integrated Systems (GEMIS, www.oeko.de/service/gemis/en/index.htm);
- FAO Land and Water Bulletin No. 5 (1997), ‘Land Quality Indicators and their Use in Sustainable Agriculture’ (www.fao.org/docrep/W4745E/W4745E00.htm), and subsequent publications;
- Sustainability Consortium (www.sustainabilityconsortium.org);
- The Standards Map, developed at the International Trade Centre (www.standardsmap.org).

3.2 Analysis of Environmental Integrity

One participant cautioned for **carefully determining on which functional unit** to base a Life-Cycle Assessment (LCA) for the environmental assessment at all life cycle stages. Furthermore, since LCA is (mostly) about comparing single products over their complete life cycles, a broader concept such as **material flow analysis**, was suggested as being more appropriate. It was stressed though by one participant that a full sustainability assessment of a food product should include an **LCA**, even if this is a complicated exercise.

We received numerous useful suggestions as to which aspects should be considered for inclusion on the environmental indicator list, the **integrity and health of soil** receiving the biggest attention. There seems to

be an agreement that the current list does not cover sufficiently the importance of soil. However, featuring all relevant aspects of soil health (soil erosion, pollution, reaction, compaction etc.) in detail was considered by one participant to be too data-intensive. Some of the proposed indicators are the following:

- the absence or presence of earthworms;
- minimum soil disturbance/reduced tillage, conservation methods to prevent soil erosion;
- organic soil cover (at least 30%);
- crop rotation/association (at least three crops);
- trainings and fostering of soil organic matter (SOM) management;
- variation in SOM content over the last three years;
- percentage of nitrogen applied in the form of organic materials, as opposed to synthetic fertilizers.

Water quality was another key issue, for which a need for more comprehensive coverage was mentioned by several participants. The suggested additional indicators are the following:

- presence of a plan governing the application (timing, amounts) of fertilizers;
- percentage of land not sprayed with pesticides;
- percentage of water way banks with anti-runoff protection, such as permanent grass bands, diversified natural hedges etc.

General comments were expressed about maximizing the “crop per drop” that farmers produce, and supporting drip irrigation technologies.

Livestock health and welfare was mentioned by several participants, the following were suggested for addition:

- aspects of disease incidence and risk;
- ability to realize behavioral needs and productivity;
- percentage of animals provided with sufficient free movement and opportunity to express normal patterns of behavior, including access to open air;
- percentage of animals with illnesses and injuries.

Yet, another participant viewed that it was difficult to evaluate animal welfare, since ethological aspects cannot be recorded in a reasonable time frame. The suggestion was raised – and we would fully support the idea – of **sharing experiences on existing farm-level indicator sets**.

On the **biodiversity** issue, statements were posted by one participant about promoting Integrated Crop Management (ICM), and encouraging farmers to adopt good practices, such as biodiversity corridors. It was suggested by a participant, writing on behalf of the International Federation of Organic Agriculture Movements (IFOAM), to assess the proportion of areas with cultivation of genetically engineered organisms.

Further suggestions included the addition of a core indicator on “**pollution and wastes**” to include the quantities of synthetic pesticides used per hectare and the quantity of non-biodegradable wastes generated. Some additional remarks were made concerning the environmental dimension:

- **indicators shall be expressed on an absolute rather than relative basis** (e.g. % of water reduction per ton of produce, rather than in the whole chain) to capture efficiency;
- a biodiversity indicator shall rate the protection of untouched arable land as a result of productivity increase on current lands;
- land quality indicators shall be monitored over time and such monitoring shall include e.g. soil structure, rise in soil carbon content, improvement of phosphate availability, increase of earthworms populations, etc.

The following resources were recommended:

- European Food Sustainable Consumption and Production (SCP) Round Table (<http://www.food-scp.eu>), an initiative that aims to establish the food chain as a major contributor towards sustainable consumption and production in Europe and it looks at assessing environmental aspects of food and drink products at all life cycle stages;
- Natural England sustainability indicators assessment tool (OCIS PG) for farms in the UK, developed at the Organic Research Centre (www.efrc.com);
- farm-level indicator set of the Response-Inducing Sustainability Evaluation (RISE, version 2.0, <http://rise.shl.bfh.ch>), developed at the Swiss College of Agriculture;
- UNECE Critical Loads Concept (www.unece.org/env/lrtap/WorkingGroups/wge/definitions.htm).

The articles, books, reports referred to by participants for consultation include:

- Biological Approaches to Sustainable Soil Systems (2006). N. Uphoff & 9 others (eds). CRC Press, 764pp. ISBN 1-57444-583-9;
- Keystone Alliance Field to Market Report (www.keystone.org/files/file/SPP/environment/field-to-market/Field-to-Market_Environmental-Indicator_First_Report_With_Appendices_01122009.pdf);
- Alrøe and Kristensen, 2003. Toward a Systemic Ethic: In Search of an Ethical Basis for Sustainability and Precaution. *Environmental Ethics*, 25 (1), pp. 59-78. Freely available at <http://orgprints.org/552/>;
- Rockström, Johan et al., 2009. A Safe Operating Space for Humanity. In: *Nature* vol 461 pp. 472-475;
- Rockström, Johan et al. 2009. Planetary Boundaries: Exploring the Safe Operating Space for Humanity; www.stockholmresilience.org/download/18.../pb_longversion_170909.pdf (a possible source of science-based thresholds for some of the environmental indicators).

3.3 Analysis of Economic Resilience

The few suggestions received with regards economic indicators were the following:

- some environmental and economic indicators are overlapping;
- there is a need to **clarify the nature of the indicators proposed in relation ways to: measuring the status quo; setting a specific target; and measuring progress**. A set of baseline indicators would be a solution, in addition to indicators measuring progress through percentages and targets;
- the calculation of energy use (including also natural resources) could be undertaken for the entire food chain, including post-consumption, such as energy requirements for waste management;
- the state of “full cost-accounting” could be measured to evaluate not only full chains per se, but full chains against all of the multiple indicators;
- some indicators are still vague; there is a need to clarify the baseline for indicators, such as: % profits invested in research and development (R&D); % of R&D expenditures aimed at reduction of ecological footprint along the chain;
- an indicator addressing private-public partnerships shall be included among investment indicators.

The relevance of the indicator called “percentage of farmers having food gardens beside the production of food sold” was questioned by one participant, since such gardens may not contribute to economic resilience at farm level.

The following initiatives were shared:

- SAI Platform’s sustainability performance Assessment (called SPA) which already identified a list of farm metrics and indicators (www.saipatform.org/activities/alias/sustainability-indicators);

- Koen Boone and Mark Dolman: Monitoring Sustainability of Dutch agriculture (http://typo3.fao.org/fileadmin/templates/ess/documents/meetings_and_workshops/ICAS5/PDF/ICA_SV_4.3_092_Paper_Boone.pdf).

3.4 Analysis of Social Well-Being

The discussion yielded some additional insights concerning the **social dimension** of the SAFA. The following additions were suggested to the present list of indicators:

- farm fatalities;
- measures to improve women's well-being (i.e. a gender indicator).

The indicators on child labor and farmers training were supported by one participant with some additional questions related to the later, which will need to be evaluated during the process of finalizing the indicators:

- when using the indicator “percentage of farmers and suppliers receiving training per year”, what is considered a sustainable number?
- would labelling and instructions count as a form of training?

The full list of 14 social indicators used by the Organic Research Centre to assess public goods provision on farms (called the OCIS PG tool) was shared with us, including issues such as:

- number of visitor events, of communications with the public and of visitors through the farm gate;
- whether employees are exposed to hazardous chemicals and how rigorously health and safety are enforced on the farm;
- numbers of staff employed (split into casual, long-term and family), numbers of training days provided to staff and how well qualified were staff employed.

3.5 Analysis of Good Governance

Questions posed:

- How should the political environment of a production site/company be taken into account? To what degree can (and should) a company be held responsible for operating in countries where fundamental rights are not respected?
- How should companies deal with politically or culturally sensitive issues, such as freedom of association, child labor and gender relations?

The following revised and additional governance indicators were suggested:

- presence of a mutually agreed formal mechanism of stakeholder involvement;
- presence of two-way flow independent mechanisms (i.e. independent mechanisms to secure a continuous flow of complaints and responses);
- anti-counterfeiting efforts – to ensure that customers are getting authentic products.

It was noted by one participant that the draft governance indicators at the moment rather favor international supply chains over local chains due to several references to percentage of adherences to certification schemes; this may not be very useful, or be too costly, for local markets. Thus, indicators should be reconsidered in order to **give equal footing to both international and local supply chains**.

4. Forum Participation

Prior to opening the Forum on 21st February 2011, the SAFA Background Document was sent to several lists of individuals associated with agriculture research, sustainability indicators and/or food industry. For example, the invitation was sent to the participants of SusCon 2010 (International Conference on Sustainable Business and Consumption) in Nuremberg, the SAI Platform, and to several lists, such as the ECOL-AGRIC (with 167 recipients) and ORCA (with 241 participants).

In distributing the announcement, we asked recipients to further share the notification because we wanted the process to be open to all. Also, prior to the Forum commencement, the drafters of this paper sought to inform interested parties through conference presentations and informal networks. For example, FAO presented the sustainability framework at the Food Summit 2010 Conference in Amsterdam, at the 2010 Nuremberg International Conference on Sustainable Business and Consumption and at the 2011 InterLabTec International Congress and Exhibition on Quality Assurance, Sustainability and Analysis in the Food Industry in Munich.

The SAFA Background Document was posted on the FAO website in such a way that anyone could read and download it anonymously; thus it is not known how many individuals actually read this document. However, to participate in the Forum itself and view the draft indicators, people were asked to register. A total of 246 people from 61 countries registered as Forum participants and entered the requested information into the E-directory.

Most people registered from the United States (39) and Italy (33). These were followed by participants from the United Kingdom (22), Switzerland (11), Germany (10), India (7), Norway and Kenya (6), and Indonesia, Denmark, France, and Finland (5). Besides these, the countries where more than 3 people registered from were Nigeria, Cameroon, Chile, Canada, New Zealand, Australia, Brazil and Belgium.

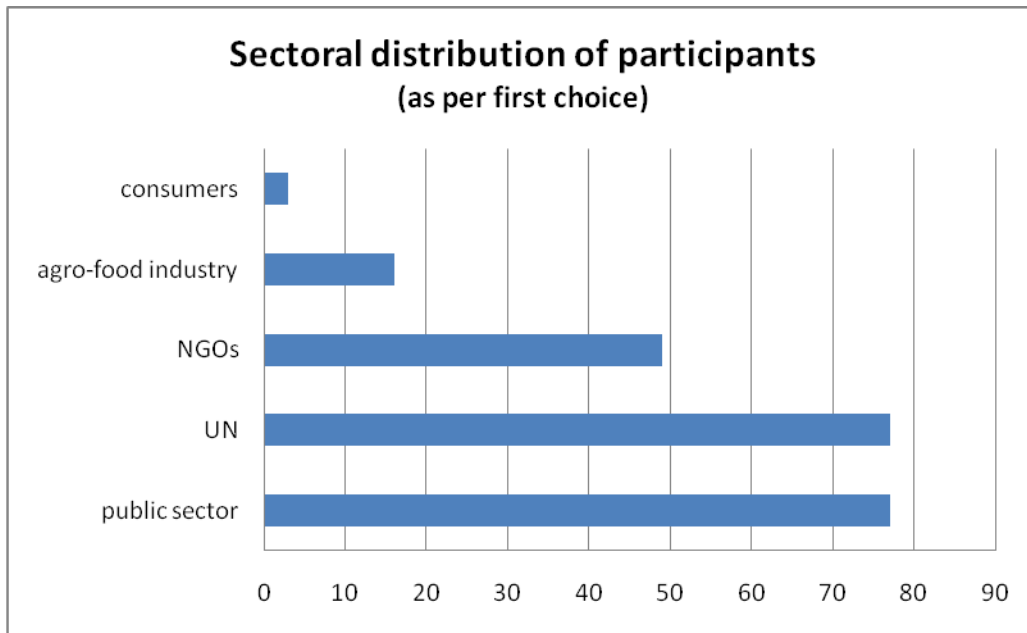
As per continents, Europe was definitely the most represented with close to 50% of participants, followed by America (23%), Africa (14%), Asia (10%) and the Pacific (3%).

E-forum participants from 61 countries (highlighted in green)



7. Macedonia 8. Montenegro 9. Serbia 10. Bosnia and Herzegovina

Forum participants were asked to indicate the sector in which they were engaged. In many cases, participants representing different institutions signaled several options, for instance the public sector, NGOs and agro-food industry. In such cases, we have chosen the first indication and thus, the chart below displays information about the first choice of participants.



The overall number of food industry representatives in the E-forum was lower than expected and participants from the public sector (i.e. research institutions, universities, government agencies) was high. The relatively high number of UN participants is due to the fact that several university researchers working together with UN agencies registered as UN; here again, when a participant gave the UN affiliation as first option, we took into account the first option indicated when grouping participants' affiliation.

5. Conclusions and Next Steps

We draw the following general conclusions from the results of the E-Forum:

The need for a universally accepted, science-based Sustainability Assessment for Food and Agricultural Systems (SAFA) has been affirmed by forum participants. **The suggested structure (goals > sustainability dimensions > core indicators > metrics) has been largely confirmed.** The suggested four-pillar concept of sustainable development requires further scrutiny.

Formulation and presentation of the purpose and scope of the SAFA require further refinement, in particular to clarify the relation of SAFA with existing initiatives and tools. For example, stakeholder roles and functional unit of the assessment require a clear definition. The mutual relation of generic and localized elements has to be clarified. The GRI Guidelines and other well-established documents will serve as models for this refinement, which is going to be achieved through a **participatory and transparent process.** This process should also ensure that the SAFA will be complementary to existing standards, i.e. it shall add value rather than complexity (see below).

The participatory approach chosen for SAFA development has proven appropriate and will hence be maintained. The number of E-Forum participants and the high quality of the forum comments reflects the big interest of a variety of stakeholders in the SAFA development. A **better representation of the agro-food industry and of consumers** shall be assured by directly contacting (via telephone, e-mail and in-person meetings) representatives of both stakeholder groups and obtaining their opinions and advice.

Given the multitude of initiatives and methods already existing, SAFA developers have to avoid duplicating efforts. The numerous information resources and initiatives that were brought to our attention during the E-Forum discussions will therefore be taken into full consideration during the next development steps. **Existing data sources and approaches will be drawn upon – given the consent of the owners – wherever possible.** Institutions and experts for holistic assessment or for single aspects of sustainability will be contacted directly and with specific questions during the next months.

Prior to contacting stakeholders and experts, the **draft SAFA background document will be revised,** including due consideration of all additions and modifications of the indicator list that were suggested by the E-Forum participants.

The SAFA Guidelines are expected to be completed and available on this website in November, 2011.