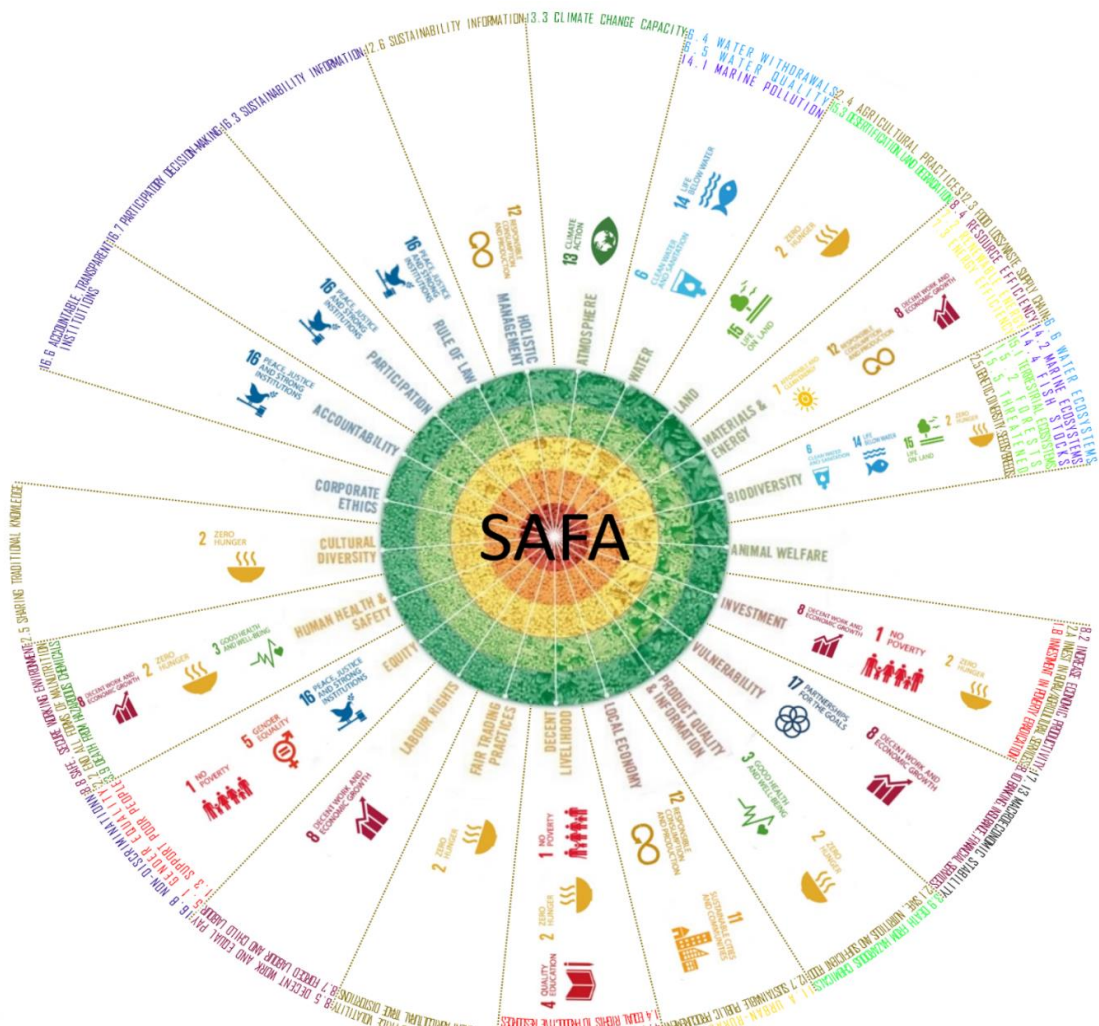




# SUSTAINABILITY ASSESSMENT OF FOOD AND AGRICULTURE SYSTEMS

for sustainable development



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# Contents

<b>Summary .....</b>	<b>5</b>
<b>Introduction .....</b>	<b>6</b>
<b>The Food and Agriculture Sector and Sustainable Development .....</b>	<b>8</b>
The Centrality of Agriculture, Forestry and Fisheries to Sustainability .....	8
The Emerging Role of the Private Sector in Sustainable Food Supply .....	9
The Core Role for Governments in Sustainable Development of the Food Sector .....	10
<b>The Food and Agriculture Sector and Social Development .....</b>	<b>11</b>
Decent Livelihoods .....	11
Access to Means of Production .....	11
Fair Trading Practices .....	12
Equity and Non-discrimination .....	13
Safety and Public Health .....	13
Respect for Cultural Identity and Indigenous Knowledge .....	14
<b>The Food and Agriculture Sector and the Economy .....</b>	<b>14</b>
Poverty and Investments .....	15
Resilience to Risk .....	15
Quality Products and Market Information .....	16
Procurement and Local Economies .....	16
<b>The Food and Agriculture Sector and the Environment .....</b>	<b>17</b>
Climate Change .....	17
Water scarcity .....	18
Land Degradation and Soils .....	18
Biodiversity and Ecosystem Services .....	19
Materials Use and Eco-Efficiency .....	20
<b>The Food and Agriculture Sector and Governance .....</b>	<b>20</b>
Corporate Ethics .....	21
Accountability and Responsibility .....	21
Participation and Inclusive Supply Chains .....	21
Legitimacy and Resource Appropriation .....	22
Full-Cost Accounting .....	22
<b>FAO's Mandate and Sustainability .....</b>	<b>22</b>

<b>Sustainability Assessment of Food and Agriculture Systems (SAFA).....</b>	<b>24</b>
SAFA Framework for Sustainability .....	24
SAFA and the Sustainable Development Goals .....	26
Towards a Sustainability Information Centre.....	31
<b>Conclusions .....</b>	<b>33</b>
<b>References .....</b>	<b>34</b>

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### **Graphs:**

Relevance of SAFA Themes to the 2030 Agenda .....	31
SAFA Themes and SDGs Targets .....	32
SAFA's Sustainability Polygon .....	34

*Know thyself*  
(Delphic proverb)

In Arabic, SAFA means “pure” and in several Asian countries, SAFA means “clarity”. Here, SAFA stands for “clarity” as regards knowledge – or awareness - of the effects of food and agriculture systems on nature and society.

SAFA’s cognitive method guides users in the self-knowledge of their agri-food operations, thus creating the foundation of sustainable living through: understanding of the numerous inter-related themes of sustainable development; measuring and valuing supply chain performance across the different themes; and deciding upon the best possible sustainability pathway of operations.

Setting goals and boundaries, choosing appropriate indicators, determining thresholds and rating performance will always be uniquely individual and context-specific. The credibility of assessments, however, is achieved through objective evaluation mechanisms and transparent reporting of outcomes in line with the SAFA principles and procedures. Through transparency, the tension between global and local goals and actions is reconciled, as readers understand the “criteria for variation” of each sustainability impact assessment.

SAFA is an invitation to understand and work actively with challenges, take hold of our relationship with people and the planet and continuously improve agri-food operations in our farm, factory or shop. External disclosure of SAFA’s outcomes encourages engaging with stakeholders, building partnerships and collectively progressing towards sustainable development.

## Summary

This paper illustrates how fundamentally interconnected the productive activities in agriculture, forestry and fisheries are to the breadth of sustainability variables highlighted in the Sustainable Development Goals. At times, the relationship between the food and agriculture sector and sustainability is a positive one, with many public goods and ecosystem services depending on good management practices in agriculture, forestry and fisheries. Other times, the food and agriculture sector represents a threat to the effective achievement of sustainability. In some instances, business-as-usual practices are seriously undermining the viability of ecosystems and the life they sustain.

In the face of growing populations, uneven distribution of resources, and the effects of climate change already being felt, decision-makers face stark choices in the decades to come as they strive to meet the Sustainable Development Goals. In this era of unprecedented speed and scale of global flows (of finance, goods, services and people) and the globalization of challenges such as hunger, poverty, environmental degradation, disease and conflict, agriculture, forestry and fisheries can no longer be planned, implemented and assessed in isolation.

The development of market economies has shown the need for more coherent institutional reform that redefines the effective role of the State at both central and local levels and its productive interaction with civil society and private-sector institutions. Consistent efforts are needed to create stable and complimentary roles for the State, private sector and civil society. In addition, the long-term dimension of sustainability cannot be addressed by economic analysis, and only appropriate structures can capture the dynamism of social behaviour and related perceptions, values and potential to adapt to new situations. Furthermore, international policy and cooperation ought not to be based only on market efficiency and competitiveness but include full costs of environmental damage, democratic decision-making processes and solidarity among nations.

Managing humanity's footprint will be essential. But just as critical will be using the bioproductive potential of the Planet wisely in order to maximise its contribution to human needs, without undermining its own resilience and capacity to regenerate. There is need for policy-making in the food and agriculture sector to take stock of the evolving international context within which agriculture, forestry and fisheries are carried-out, including the growing role of multinational corporations and voluntary approaches to climate change, energy and water shortages. There is the need to identify the unique roles that policy-making and regulation must play, and how governments (and FAO) can better collaborate with non-governmental and private sector partners. Integrated analytical tools are needed to this end.

SAFA – Sustainability of Assessment of Food and Agriculture systems - offers such analytical tools and interestingly, this paper demonstrates the high converge of SAFA with the Sustainable Development Goals.

## Introduction

1. This paper explores the nexus between the agriculture and food sector and sustainable development. Specifically it examines how food security and human development are inextricably linked to the effective management of agriculture, forestry and fisheries resources; and how the food and agriculture sector depends on, and impinges upon, the sustainability of the world's ecosystems, populations and markets.
2. Development in this new millennium is greatly challenged by climate change and climate variability. In 2008-09, the world was confronted with multiple crises: fuel, food and financial. The result of these crises was (and continues to be) the worst global economic recession since the Great Depression in the 1930s. Throughout the food price crisis of 2008 and the Rio+20 process, the global community acknowledged the inter-connectedness and lack of progress on goals such as reducing food insecurity, poverty, climate change, water insecurity and hence, delivering to the 1996 World Food Summit to reduce hunger. Sustainability is not a simple add-on to the primary goal of achieving food security but the main benchmark for effective food systems.
3. The collective failure to prevent or manage human and environmental crises has occurred despite the explosion, in recent decades, of policies, instruments and initiatives, from governmental, non-governmental and market actors alike, to achieve sustainable development outcomes across a broad range of economic sectors, supply chains and regions.
4. The scale of the challenges faced as a global community, from the eradication of hunger and poverty, to reversing the impacts of anthropogenic climate change, call for collective and collaborative action. Governments can no longer act independently from one another, nor in isolation from private actors. Power and decision-making in food systems ranges from producers, through retailers and traders, to corporate entities involved in funding research and public outreach programmes.
5. Furthermore, a traditional approach of relying on a "command and control" style of government regulation is no longer sufficient, in a geopolitical environment where drivers for policy lie increasingly outside national boundaries. The evolving structures of global production (multinational enterprises and global supply chains) pose increasing challenges for conventional regulation within single ministries, and often even by a single state; or at the international level by governments alone. This led to the emergence of trans-national private regulations, where private actors, often in cooperation with public actors, have made attempts to sustainably manage cross-boundary food issues (e.g. food safety).
6. Yet, there is still need to understand how governmental interventions in different policy domains can link-up in such a way as to build positive synergies and avoid wasted efforts and resources. There is need to further explore and

understand how governmental initiatives can better work with those of the private and non-governmental sectors. The transition towards sustainable food systems and the policies that guide it requires good governance that can only be achieved through participation of all parties and transparency throughout appraisal, implementation and evaluation.

7. Within the framework of the UN Conference on Sustainable Development in Brazil in 2012 (referred to as Rio+20), the international community discussed new ways of developing the concept of sustainable development beyond the 2012 Summit, mainly with regards practical ways for a coherent implementation of the different pillars of sustainability - moving away from trade-offs to synergies between the political, economic, social and environmental dimensions of development.
8. Policy-making in agriculture, forestry and fisheries is still largely based on national priorities. Yet, the challenges that the food sector faces are global, playing out in highly interconnected financial, energetic and natural resource-based environments. The Rio+20 Summit reassessed the role for agriculture, forestry and fisheries in this new context, and the Sustainable Development Goals approved in September 2015 reflect the importance of sustainable food and agriculture systems for most global goals. Indeed, the food and agriculture sector can lead in driving and delivering sustainable development.
9. It is within this context that FAO released a conceptual framework for Sustainability Assessment of Food and Agriculture systems (SAFA) on the occasion of Rio+20, in June 2012, while the fully-fledged “SAFA Guidelines” and “SAFA Indicators” were released in December 2013. In response to practitioners’ demand, FAO developed in 2014 the “SAFA Tool” for enterprises’ self-assessment of value chains, as well as, in 2015, the “SAFA Smallholders App” for assessing the performance of subsistence and commercial agriculture producers. Although SAFA is a multi-purpose framework, its primary goal is to trigger continuous improvement of enterprises, large and small, in delivering on the ground 360° sustainability.
10. Feedbacks from SAFA users (e.g. producers, processors, retailers, traders and development workers in agriculture, forestry and fisheries) are collected in the “SAFA Database” hosted by FAO-NRC. Once sufficiently populated and publicly available, this Database could become a practical Sustainability Information Centre, servicing member countries in their pursuit of the Sustainable Development Goals.



## **The Food and Agriculture Sector and Sustainable Development**

### **The Centrality of Agriculture, Forestry and Fisheries to Sustainability**

11. The primary purpose of agriculture, forestry and fisheries is to produce the food, fibres and fuel that sustain and enhance the lives of human populations. As productive activities, they have and continue to transform the natural environment, modifying the functioning of natural ecosystems and impinging upon the characteristics of natural resources – from soil and water to air and biodiversity. As productive activities, agriculture, forestry and fisheries have and continue to shape societies and entire ecosystems. The quality of their management has, over centuries, made the difference between the rise and fall of civilisations.
12. The impacts of agriculture, forestry and fisheries on the natural environment are considerable. The technological developments of the last two centuries, and in particular those of the last fifty years responding to growing levels of demand, have increased the impacts of the agriculture and food sector. Productivity gains have not been without social and environmental costs – most notably the over-exploitation of finite (or very slowly renewable) resources, and increased polarisation of the access to resources amongst and between populations.
13. At the same time, however, certain forms of fisheries, forestry and agriculture have provided a wide range of both social and environmental benefits to society. Should agricultural management be optimized, it can become a significant opportunity for conserving natural resources and mitigating climate change. The Millennium Ecosystem Assessment (MEA) describes four categories of ecosystem services: provisioning services (such as the production of food, feed, building materials and fuels); supporting services (such as nutrient cycling and soil formation); regulating services (such as climate and flood regulation, water purification, pollination and pest control); and cultural services (including aesthetic, spiritual, educational and recreational services). Agriculture, forestry and fisheries significantly affect and contribute to all of these.
14. A large proportion of the global population still depends on forestry, fisheries or agriculture not only for livelihood but for subsistence. It is, however, misguided to consider that only a sub-set of the global population depends on the sectors. Based on the ecosystem services identified above, everyone's life depends on the services provided by the Earth's natural systems. Humanity depends on healthy ecosystems. Without them, the Earth would be uninhabitable. As such, sustainable agriculture, forestry and fisheries are not only critical for food security and environmental management, but for life on Earth.
15. The evidence that we are consuming the resources that underpin ecosystem services much too fast (faster than they can be replenished) is compelling. In 2005, consumption was 30 per cent greater than supply and 13 August 2015 marked the first Earth "overshoot day". This means that humanity is using more natural resources and accumulating carbon dioxide in the atmosphere than what the planet can replenish, resulting in a dangerous ecological deficit. The cost of

this “overspending” translates in soil erosion, climate change and other negative externalities that will have devastating effects on food production and human survival.

16. Global population (more than 9.2 billion in 2050) and increasing purchasing power (per capita incomes are expected to rise by 3.5 per cent per year over the next decades) of developing countries will dramatically increase global food demand. According to the current food system model (that comprises high levels of food wastage), food production will need to increase, as compared to years 2005/7 by around 60 per cent by 2050 to meet the demand for food, water, fibre and energy.
17. With decreasing ecological endowments and increasing social asymmetries, the current model of production and consumption cannot possibly be sustained. It is only by taking appropriate action in how agriculture, forestry and fisheries respond to the population and consumption growth drivers and adapt to change that many global challenges will be successfully met.

### **The Emerging Role of the Private Sector in Sustainable Food Supply**

18. ITC’s Standards Map documents over 200 sustainability standards, codes of conduct and protocols addressing sustainability hotspots in global supply chains. More than 3 000 global firms regularly issue reports on their social and environmental practices according to own codes or cross-industry codes.
19. The recognized value of holistic metrics for sustainability has sharply increased recently, as evidenced by the growing number of organizations shifting to impact assessment tools that maintain cost-effectiveness in data collection and analysis and communicate results in a useful manner to business users. Although several public institutions (e.g. Inter-American Development Bank) are keen on impact assessment, it is the private sector (e.g. McDonald, Mondelez/Kraft) that are stimulating the demand to understand supply chain sustainability, in response to their shareholders and customers’ demand.
20. Value-chains are essentially cross-boundary and expand beyond national policies. States weakness as a global regulator and the expanding international market sparked the emergence of transnational private regulation for making sense of transgressed borders in a globalized economy. Fast-changing markets and global value chains require highly technical information that is best managed by private actors, such as retailers. Inter-state externalities of global public goods - such as CO<sub>2</sub> emissions, food safety, financial stability, human rights - entail high transaction costs of cooperation to ensure cross-border effectiveness. The use of supply chains as instruments of transnational cooperation represents an innovative approach of effective regulation across multiple forms of governance and partnerships in the realm of food security, environmental safety and human rights.

21. Transnational private regulation (TPR) fills the divide between public/private and domestic/international space with new rules (e.g. standards, codes of conduct), practices (e.g. contracts, voluntary agreements) and processes across jurisdictional boundaries, as agreed upon by economic actors and social players. TPR regulates the conduct of private actors, albeit frequently in collaboration with private entities; most of the time, public actors operate as facilitators, or even promoters, of TPR. Private governance is not an alternative (but a complement) to international public regulation, as this choice has often backfired (e.g. financial markets). TPR has filled gaps when States failed to agree on a common agenda (e.g. environment) but as issues emerge as global policy problems, inclusiveness of schemes' governance is decisive for their legitimacy and hence, effectiveness.
22. As TPR spread through global markets, there is need to ensure that these schemes evaluate their practice through adequate measurement tools and a greater use of impact assessment. TPR's high variability calls upon objective evaluation mechanisms and comprehensive impact assessment in order to evaluate effectiveness: assessment is a means towards higher efficiency and further improvements. Evaluation is crucial for any scheme legitimacy and in turn, effectiveness, especially when the objectives of stakeholders differ (or even conflict).

### **The Core Role for Governments in Sustainable Development of the Food Sector**

23. What is defined "ecosystems services" in ecological terms, may be called "public goods" in economic terms. Ecosystem services and public goods are often spoken about in nearly interchangeable terms, when referring to the outcomes, or impacts of the good or service. However, from an economic perspective, "goods" are subject to economic transactions. There is a difference between those services that are by-products of agriculture, forestry and fisheries and those that require financial support to be delivered.
24. Market mechanisms alone have proven to be poor providers of goods which have a high degree of "publicness"; where consumers cannot be excluded from consuming the good (e.g. climate, soil) leading to the over-exploitation phenomenon known as the "tragedy of the commons". Furthermore, ecosystems are by their very nature the coming together of a variety of interconnected functions which cannot be separated or, often, individually provided, without causing further (often unintended) effects. In economic terms, they have inherent "spillovers" or "externalities".
25. For public goods with a high degree of publicness, society's present and future collective demands need to be enshrined in policies, targets and spending plans. Moreover, governments should provide (at global and national levels) the policies that enshrine the leadership that is to be taken in securing public goods, as well as the frameworks within which the private and voluntary sectors must operate to support and enhance governmental action. Finally, governments have a unique role in supporting the development of innovation and early stage solutions, as well as rewarding sustainable food and agriculture systems.

## **The Food and Agriculture Sector and Social Development**

26. Social sustainability is about the satisfaction of basic human needs and freedom to satisfy one's aspirations for a better life. Food insecurity results primarily from baffled rights, such as access to basic resources to produce or to buy food, as well as the rights of women, migrants and children in the field. SDG2 Hunger is most relevant for social development, as well as SDG1 Poverty, SDG4 Education, SDG5 Gender, SDG8 Work and SDG16 Justice for addressing key food and agriculture rights.
27. Since the 1960s, total world food production has increased by 145 per cent. In theory, each person today has 25 per cent more food when compared with 1960s levels. Globally, there are enough food calories per capita to feed the entire world population. However, 795 million people remain undernourished today and nearly one third of children under age five in the developing world are stunted, due to malnutrition and frequent infections; in fact, 2.4 billion people lacked access to improved sanitation in 2015. In practice, there are still too many hungry people, inspite technological progress and globalized exchange of goods and services. These aggregate figures hide important distributional inequalities. Uneven development and widening social gaps at all levels call for a right-based approach to food and agriculture development.

### **Decent Livelihoods**

28. Decent livelihoods encompass income, as well as the tangible and intangible resources used by people to generate income and have the ability to save for future goals. An estimated 2.5 billion people, or around 40 per cent of the world's population, depends on the sector for their livelihoods. The bulk of these households reside in rural areas. Agriculture is a source of livelihood for an estimated 86 per cent of all rural households, providing jobs for 1.3 billion smallholders and landless workers.
29. Producing or procuring and preparing healthy meals and culturally-appropriate and nutritionally-adequate diets is the first determinant of life quality. Self-determination of communities in food access and choices requires empowerment of low-income communities through sustainable and local agriculture.

### **Access to Means of Production**

30. In most developing regions of the world, access to natural resources provides the basis for food security. Land, water and agrobiodiversity are central to food production, while forests and other community resources support subsistence harvesting. This is illustrated by the example of poor households in South East Ghana who derive 20 per cent of their food from the commons during the pre-harvest period. Access to land and common resources is a crucial issue when dealing with the right to food. In India, Nepal and Thailand, for example, fewer than 10 per cent of women farmers own land in their own right. In developing economies, access to land is often insecure due to contested rights, ineffective

legal frameworks, land scarcity and increasingly, land grabs by foreign investors.

31. The changing nature of agricultural production as a result of increasing climate variability and product structure is likely to increase the demand for trained researchers and agricultural professionals. However there is some doubt as to whether the existing education and training structures are able to provide this, particularly in Sub-Saharan Africa. Among the 27 African countries, half saw a decline in the number of agricultural researchers in the 1990s. Furthermore, Regional averages for Sub-Saharan Africa, South Asia, and the Middle East and North Africa show that rural adult males have roughly 4 years of education, and rural adult females have 1.5 to 4 years. This is between two and four years less than levels found in urban areas. The primary cause of this schooling gap is the low rate of return to schooling that traditional agriculture generates. For example in Bukidnon, Philippines, the main agricultural activity is harvesting. In this context, raising the level of schooling was shown to have no effect on wages.

### **Fair Trading Practices**

32. Globalization of trade has created unfair competition to producers in both developed and developing countries. Highly concentrated and multi-national buyers encourage pricing schemes that do not cover the full cost of primary production, nor reflect the full costs of production to society. Producers face buyers without the necessary information or power to negotiate fair market terms. It is common today to see food companies increasing their profits, while their primary producers receive less.
33. The returns that primary producers obtain from participating in global supply chains need to be questioned. Raw commodities are typically only a small proportion of the value of the final product and the downstream stages of the chain are not always competitive. Coffee producers, for example, receive only 10 per cent of total value added - while processors, roasters and retailers receive between 20-30 per cent, respectively. Even where the commodity involved requires little processing, the share accruing to primary producers can also be small. In the case of fresh Nile perch exports, it is estimated that Tanzanian fishermen receive about 15 per cent of the final product value, compared with 61 per cent that is received by retailers. This not only raises questions about market structures and market power but also the strategies that can be used to offset this power: regional branding, geographical indicators, niche products and alternative marketing channels may offer better alternatives.

### **Labour Rights**

34. In many countries, workers in the agricultural sector are excluded from labour legislation while in other countries, lower standards apply to them, especially to temporary and migrant workers. Farm workers are often allowed to work longer hours (when not abused), as compared to other workers in the economy. In addition, labour inspection rates for agriculture, fisheries and forestry businesses

are low. Thus, forced labour, violence, denial of basic freedoms and unfair employment conditions are not uncommon.

35. Agriculture is the single biggest user of child labour and accounts for nearly 60 per cent of all child labour: around 98 million girls and boys under 18 work in agriculture, thus harming children's rights to education. Data from nine Latin American countries demonstrated that, third and fourth graders who worked longer hours outside the home performed less well in school.

### **Equity and Non-discrimination**

36. In the food and agriculture sector, vulnerable and precarious working conditions prevail on farms, both among household members and in terms of allocation of resources between cash and subsistence crops. Discrimination against women is particularly important. In Sub-Saharan Africa, women produce up to 80 percent of basic foodstuffs for both the household and for sale, while in Southeast Asia women provide up to 90 per cent of the labour used in rice cultivation. Despite this contribution, women have poor access to the inputs required to increase output and yields. Furthermore a study of farm credit schemes in Africa found that women's share of loans was just 10 per cent. The willingness of women to adopt new production technologies is strongly influenced by who controls and ultimately, who benefits from this investment. In Andhra Pradesh, India, 77 percent of women's income in some areas is derived from forests; restrictions on access to these common resources affect men and women in different ways. A study in Malawi found that deforestation was forcing elderly women to walk more than 10 km a day to collect fuel wood.
37. Elderly and other vulnerable people, such as HIV/AIDS struck primary producers and agricultural workers, often lack support to accommodate their disability. HIV/AIDS disproportionately affects sectors such as agriculture which are labour-intensive and have large numbers of seasonal and migrants workers; between 1985 and 2000, an estimated 7 million agricultural workers died from HIV/AIDS, leaving behind even more vulnerable people, such as women or children-headed households.

### **Safety and Public Health**

38. Globally, agriculture is recognized as one of the most dangerous industries to work in. In 1997, 170 000 deaths resulted from workplace accidents related to the agricultural sector. Most of these deaths resulted from the use of machinery and equipment, such as tractors and harvesters. Exposure to pesticides and other agrochemicals constitutes the main health risk to those working in the primary production sectors. It is estimated that between two and five million cases of pesticide poisoning occurs each year, leading to approximately 40 000 deaths.
39. In 2001, after many years of campaigning by agricultural trade unions, the ILO developed and adopted a new convention on safety and health in agriculture. This gives agricultural workers the same rights in international law as other workers. Getting governments to ratify the Convention and then implement its



provisions remains a challenge. By the end of 2015, only 16 countries had ratified the Convention.

40. By polluting and contaminating soil, water and air, food and agriculture operations threaten the health and wellbeing of surrounding communities. An evaluation of the impact of pesticides and soil erosion on livelihoods, health and conflicts was evaluated to 1 trillion USD in a case study of global food loss and waste, which represents about one third of global production. Food-related pandemics are major threats to public health with 2.2 million gastrointestinal deaths each year. Also, the incidence of infectious diseases transmissible from animals to humans (e.g. H5N1 avian influenza), mainly due to intensive production systems, are increasing at an alarming rate.

### **Respect for Cultural Identity and Indigenous Knowledge**

41. There are approximately 370 million indigenous peoples worldwide. They represent 5 000 different linguistic groups and are distributed across more than 70 countries. Indigenous peoples make up about 5.5 per cent of the world's population, yet they constitute 15 per cent of those living in poverty. A core part of the identity and spirituality of indigenous peoples is linked to their relationship to their traditional lands and territories. Land and access to natural resources is the foundation of indigenous peoples' subsistence activities. Relinquishing control of these resources not only erodes their food and livelihood security, but can threaten their cultural survival.
42. Producers' ability to preserve and use traditional, heirloom and locally-adapted varieties and breeds is increasingly compromised by the prevailing intellectual property rights system. For example, Mayan peoples (Mexico) traditional fermented drink called *pozol*, a source of nutrition and a natural preventative for intestinal infections, was patented in 1999 (by the Dutch corporation Quest International in conjunction with the University of Minnesota) for its active component against intestinal infections. Profits from these medicines, likely to run to hundreds of millions of dollars, will not be shared with the Mayan community upon whose traditional knowledge these "new" medicines will be derived from.

### **The Food and Agriculture Sector and the Economy**

Although the food and agriculture sector provides livelihoods to almost half of humanity (40 percent), it represents 12 percent of GDP in developing countries, and only 4 percent for global GDP. Thus, no single SDG applies heavily to the sector but rather, many single SDG targets apply, including SDG1 Poverty, SDG2 Hunger, SDG3 Health, SDG8 Decent Work and Economic Growth, SDG11 Cities, SDG12 Sustainable Consumption and Production and SDG17 Means of Implementation.

## Poverty and Investments

43. At the macro-economic level, growth in agricultural output has been shown to be more beneficial to the poor than growth in any other sector. Studies have found that GDP growth originating from the agricultural sector is, on average, at least twice as effective in benefiting the poorest half of a country's population as growth generated in non-agricultural sectors. This is because three quarters of the world's poor, about 900 million people, live in rural areas and directly and indirectly depend on the agricultural sector.
44. Food prices were declined for many decades until 2008 due to significant expansion in crop production. FAO's Food Price Index was 51 percent higher in September 2008 than in September 2006, resulting in two groups of developing countries (least-developed and net food importers) facing a food import bill of USD 22.2 billion for 2007-08, more than double (125 per cent higher) the amount of five years earlier (USD 9.8 billion). The underlying factors (e.g. oil prices, drought, biofuels, speculation) behind rising food prices are not going away, and volatility will be a characteristic of the global food market for years to come.
45. Investments in agriculture are a pre-requisite for the sustainability of operations. Short-term gain operations result in losing the natural capital on which operations strives (e.g. land). Investments are also important for building the buffering capacity against any type of shock (e.g. building soil organic matter to withstand drought). Most importantly, the need to produce more food with less natural resources endowments calls for investments in alternative research and learning for a greener economy. Currently, very little resources are invested in green technologies. For example, only 11 percent of EU agricultural investments go to agroecology or organic management initiatives. Where virtuous systems exist, payments schemes reward producers for providing ecosystem services to the wider community.

## Resilience to Risk

46. Price volatility is problematic for commodity-dependent countries and producers. More than 65 per cent of all developing countries derive at least half of their foreign exchange earnings from commodity exports. Commodity prices tend to be highly volatile in the short-term and can vary as much as 50 per cent within in a given year. Moreover, commodity price volatility will continue to increase, due to market globalization, climate change and peak oil. Unstable prices increase economic risk, impairs financial planning and reduces the opportunities to access finance markets, driving producers to adopt low risk production techniques that maybe more harmful to the environment and health.
47. Diversification represents a risk management strategy for inherent risks associated with unpredictable economic and agro-climatic circumstances. For example, polycultures ensure stability of farm production: if one crop fails, others will yield. Accessing alternative marketing channels in case agreements or business relationships are discontinued contribute to market stability.



48. One strategy to deal with economic risk is contracting to manage intra-seasonal price volatility. Empirical evidence from Madagascar shows that participation in contract farming directly increases total household income by 12 per cent, while decreasing the duration of the hungry season experienced by the average household by about two months. However, contractual arrangements are not always fair. There are many reports of buyers with increasing financial returns whose producers receive less for their produce.
49. Risk management involves, among others, buffering in the face of uncertainties. Countries, regions, enterprises or households that can normally afford importing food are particularly vulnerable to international shocks for their food security. For example, in the aftermath of 11 September 2001, Caribbean people suffered food insecurity, as result from transport disruptions. More consistent food supply disruptions occurred in 2008, as result of the food price crisis that induced producing countries to limit food exports. Thus, keeping local food stocks, where possible, decreases vulnerability to macro-economic shocks.
50. Only 10 per cent of poor people living in the rural areas of developing countries have access to financial services. Rural financial services support farmers and their organizations in financing agricultural activities, such as input supply, production, distribution, wholesaling and marketing. Evidence shows that a well-developed financial sector, including financial services for rural people, is critical to long-term economic growth and hence, poverty reduction. The saving capacity of households is of particular importance: it allows shocks to be absorbed and serves as collateral for accessing credit. It thus reduces vulnerability of rural households and allows them to build up their assets.

### **Quality Products and Market Information**

51. Food contamination (chemical and biological), together with deception concerning origins and quality, has prompted efforts to improve food safety and the establishment of traceability systems, as well as quality certification. Today, there are hundreds of labels claiming specific attributes and their market share is growing. For example, certified organic products retail value was in the range USD 80 billion in 2014, and this sector' growth has been steady in the past 20 years.

### **Procurement and Local Economies**

52. Local economic development has been considered a corner stone of sustainable development. Beyond economic growth, it provides local employment and contributes to resilience in times of turbulent macro-economies. In the food and agriculture sector, local economic activity is particularly important to contrast the alarming trend of urbanization; in the last 50 years, 800 million people moved-out from rural areas. In the next decades, the whole increment in global population will concern urban areas. It is expected that in poor countries, this will result in a shift from rural to urban poverty, expanding slums, further pressures on social services, abandonment of agricultural land and loss of fertile cropland to cities.

53. Enterprises in the food and agriculture sector are in a particularly good position to invest in local economic development where local value creation (e.g. food processing) is most needed. In fact, local food supply chains linking cities and neighboring villages are on the rise everywhere. One of such most extended networks is Ecovida in Brazil, counting 2 300 farmer families, 25 support organizations, 15 consumer cooperatives, 8 marketing enterprises and 7 agro-industries. The Ecovida network links producer and consumer cooperatives to market organic products. These links build consumers' trust and raise their awareness on organic agriculture. In addition, the definition of ecological standards, as well as the verification of procedures, are jointly established by farmers and consumers.
54. Local procurement policies, especially from the public sector, can considerably encourage local supply chains to flourish, benefitting local institutions - such as schools and hospitals - with local and sustainable produce. The potential of sustainable public procurement as a policy instrument is increasingly recognized. Public authorities in developed countries have an estimated budget of about 12 percent of GDP for direct public procurement and their choices can have a significant impact on the overall direction of the market of particular products, with knock-on effects on 25 percent of the market.

## **The Food and Agriculture Sector and the Environment**

All ecological SDGs, including SDG6 Water, SDG13 Climate, SDG14 Oceans and SDG15 Land, as well as SDG7 Energy, are important to the food and agriculture sector. Natural resources are as crucial for food and agriculture production, as much as food and agricultural practices determine the destruction or the sustainability of natural resources.

### **Climate Change**

55. Deforestation is responsible for 15 per cent of global greenhouse gas (GHG) emissions. Tropical forests, where deforestation is most prevalent, hold over 210Gt C, and almost 500Gt C in their soils (which is often released in land use change). Without significant, concerted action, current deforestation rates could generate emissions of 10Gt of CO<sub>2</sub> per year for 50-100 years, emitting more GHG than any other source, apart from the combustion of fossil fuel.
56. Agriculture accounted for an estimated 5.3 GtCO<sub>2</sub>-eq/year in 2014, or 11 per cent of total global anthropogenic emissions of GHG. Temperate farmland can have as much as 20-30 times the biomass below the surface as above it. Soil carbon can exceed 110 metric tons per hectare. Bad agricultural practices tend to mobilise the carbon by converting it to carbon dioxide, which escapes into the atmosphere. Nitrous oxide (N<sub>2</sub>O) (a GHG hundreds of times more potent than CO<sub>2</sub>) is produced from the interaction of synthetic fertilisers and soil bacteria. Much of the planet's methane (CH<sub>4</sub>) emissions come from the livestock production and continuously flooded rice paddies.

57. In high seas fisheries, the use of large amounts of fuel results in considerable GHG emissions. Global fisheries burned almost 50 billion litres of fuel in the year 2000, to land around 80 million tons of marine fish and invertebrates. Thus, global fisheries account for at least 1.2 per cent of global oil consumption. This is equal to the consumption of the Netherlands – the world's 22<sup>th</sup> largest oil consuming country. An estimated 50 per cent of the carbon in the atmosphere that becomes bound or “sequestered” in natural systems is cycled into the seas and oceans. However, degradation of marine ecosystems is reducing their ability to absorb CO<sub>2</sub>. This loss of capacity is equivalent to 1-2 times that of the annual emissions from the entire global transport sector. Some 93 per cent of the earth's CO<sub>2</sub> is stored and cycled through oceans.

### **Water scarcity**

58. About 70 per cent of the global withdrawal of freshwater is used by the agricultural sector. As agricultural production will grow even further, water consumption is predicted to rise by 13 per cent in 2050. Irrigation and bore wells were an essential part of the Green Revolution, but their unregulated and indiscriminate use has led regions of groundwater plenty to become unproductive or unable to sustain human settlements. Dam building to divert water for agriculture (as well as industrial and energy) use has led to the demise of previously fertile river basins. An estimated 1.4 billion people now live in river basin areas that are “closed”, in that water withdrawal exceeds the minimum recharge levels, or near closure. Such basins cover more than 15 per cent of the world's land surface.
59. Around 50 countries are already experiencing moderate to severe water stress on a year-round basis, while many more are affected by shortages during part of the year. Pressure on freshwater resources is increasing also as a simple function of the growing demand for water-intensive products (e.g. Livestock products). This is compounded by climate change that will increase water scarcity in several parts of the world (e.g. North Africa).
60. At least 70 percent of pesticide pollution in surface waters originates from agriculture. Surface run-offs, soil erosion and floods further carry excess nutrients from nutrient-rich agricultural soils, thus contributing to freshwater and coastal water pollution and often, eutrophication. Nitrogen and phosphorus-related eutrophication causes algal blooms that severely reduce the available oxygen in water, resulting in loss of animal species.

### **Land Degradation and Soils**

61. Since 1945, moderate, severe or extreme soil degradation has affected 1.2 billion hectares of agricultural land, globally, an area the size of China and India combined. At least half the time, the degraded soil is no longer able to retain sufficient moisture to make restoration easily possible. Since 1960, one-third of the world's arable land has been lost through erosion and other degradation, and the rate continues at about 10 million hectares per year. Increased demand and unsustainable practices in agriculture, plantations and forestry exhaust the land,

leading to more conversion of virgin lands (e.g. wetlands). Desertification was identified in 1992 Earth Summit as the greatest challenge for sustainable development.

62. Most of the world's biodiversity lives in soils; more microbes live in one teaspoon of soil than people on the planet. In the top few centimetres of one square meter of rich healthy soil, one can find up to 1 000 ants, spiders, wood lice, beetles and larvae; 2 000 earthworms, millipedes and centipedes; 8 000 slugs and snails; 20 000 pot-worms; 40 000 springtails; 120 000 mites and 12 million nematodes.

### **Biodiversity and Ecosystem Services**

63. Between 1970 and 2005 alone, the Earth's wildlife populations have declined by a third, with most change occurring in the tropics. Biodiversity is essential for humankind and there are two different kinds of values that prove it. On one side there are instrumental values that enhances the well-being or quality of some valuable entity or state of affairs, and there is no question that many elements of biodiversity facilitate human welfare or happiness. On the other side there are intrinsic values that have a non-instrumental value. In other words, the intrinsic value of an entity refers to the value that it has in and for its own right, independent of its use, function, or value to any other object.
64. By an instrumental point of view, the average annual economic value of ecosystem services (such as pollination, pest management, water purification) in 1997 has been estimated as USD 33 trillion for entire biosphere and as USD 319 billion for the United States; These free services of nature can only be minimally replaced by technological progress. Biodiversity or its elements may also have so-called option values, which means that an object that we are unable to exploit now may become valuable in the future.
65. Most of terrestrial biodiversity is found in forest ecosystems. 7 million hectares of forest are lost per year between 2010 and 2015 to deforestation, mostly due to conversion to agriculture. The wholesale conversion of any natural habitat, whether forest, grassland, savannah or wetland, inevitably results in biodiversity loss and the loss of ecosystem functions, such as water flow regulation and purification. Protected areas, which cover over 14,18 percent of land surface, can only effectively protect wildlife if natural or semi-natural structures are maintained on agricultural lands in order to allow ecosystem connectivity (e.g. riparian corridors) and thus, exchange between populations of key species.
66. Of the 25 000 known species of fish in the world, 10 000 (or 40 percent) live in freshwater. In terms of their size relative to the earth's surface, freshwater ecosystems (wetlands, rivers and lakes) account for a disproportionately large fraction of global biodiversity. 61 percent of the world's marine fisheries are fully exploited, and 29 percent are overexploited, depleted, or recovering from depletion. As many as 90 per cent of all the ocean's large fish have been fished out. Several important commercial fish populations have declined to the point

where their survival is threatened. Unless the current situation improves, stocks of all species currently fished for food are predicted to collapse by 2048.

67. Agriculture uses only 5 cereal crops to provide for 80 percent of human diets. Only 10 fish species provide about 30 percent of marine capture fisheries and 10 species provide about 50 percent of aquaculture production. Of the 8 300 animal breeds known, 8 percent are extinct and 22 percent are at risk of extinction. With the erosion of agricultural biodiversity, humanity loses the potential to adapt ecosystems and the food system to challenges ahead, such as climate change.

### **Materials Use and Eco-Efficiency**

68. Eco-efficiency measures the rate at which the environment is negatively “used” or affected, per unit of economic activity or output. The challenge is to reduce the relative amount of energy and materials (such as Nitrogen and Phosphorus) needed for the production, consumption and disposal of a single unit of a good or service.
69. While the agricultural sector has increased its overall eco-efficiency, it is lagging behind other sectors. Data from the European Union showed that, between 1990 and 1997, the gross value added by the agricultural sector increased by 5 per cent. Over the same period the sector’s energy use and area of irrigated land increased at a faster pace (over 5 per cent) while its emissions of acidifying substances declined by 10 per cent. While this decline represents an improvement, other sectors of the economy have managed to reduce their emissions by up to 50 percent. Food and agriculture is the only sector that could establish a closed nutrient and energy flow system, with benefits such as carbon-neutrality of operations and even carbon sink, should a major shift occur towards renewable agriculture.
70. About one third of food produced (1.6 Gtonnes of primary products per year) globally never gets eaten, resulting in wasted natural resources and non-renewable inputs, with emissions of 4.4 Gt C-eq per year, an amount equivalent to 87 percent of global road transportation emissions. Furthermore, food loss and waste has a blue water footprint of about 250 km<sup>3</sup>, while vainly occupying almost 1.4 billion hectares of agricultural land.

### **The Food and Agriculture Sector and Governance**

71. While the role of institutional structures was recognized as one of the four main sustainability pillars at the 1992 Earth Summit, good governance needs today specific attention, as none of the sustainability goals could be attained without it. SDG16 seeks to “promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.” Governance in the food and agriculture sector revolves around understanding corporate governance impact on all affected stakeholders throughout the food supply chain.

## Corporate Ethics

72. In the globalized and commodified food system, ethical business purposes go beyond mere profit. Decision-making must be mission-driven, guided by appropriate risk assessment. Interest in food business ethics accelerated dramatically in the last decade. In fact, most agri-food corporations today promote their commitment to non-economic values under headings such as ethics codes and social responsibility charters.

## Accountability and Responsibility

73. Multinational food companies, global sourcing arrangements, expanding supermarkets and relocalization of food supply systems through national and regional markets profoundly affect decision-making along the food supply chain. Although in recent years, most large companies have adopted corporate social reporting, disclosure of information remain fragmented or even deliberately withheld from key stakeholders. The transparency and credibility in food chains can greatly be enhanced by impact assessments along adequate measurement tools.

## Participation and Inclusive Supply Chains

74. In 2013, six corporations (i.e. BASF, Bayer, Dow, Dupont, Monsanto, Syngenta) controlled 75% of global agrochemical market, 63% of the commercial seed market and more than 75% of all private sector research in seeds and pesticides. Their combined research and development budget was 20 times bigger the CGIAR's total expenditures on crop/breeding research and genebank conservation. They have not only eliminated competition from public breeders and small companies, but have their hands in crop insurance to make sure farmers buy their products. Whereas multinational breeders offer fewer choices to farmers (as compared to local seed companies), the current tendency of agricultural corporation concentration threatens global food security (and more so, sovereignty), with devastating impacts on smallholder livelihoods.
75. The shift towards vertically integrated, globalized, supermarket-driven supply chains raises questions on the extent to which small-scale producers can access these chains. Large buyers typically demand quality, uniformity, reliability of delivery and product differentiation and this has raised the level of competence required of small producers. Moreover, quantity requirements of large buyers involve smallholders having to enter into new coordination arrangements. Small-scale farming, mostly of staple food crops, constitutes about 80 per cent of African agriculture. Furthermore, smallholders worldwide have been shown to achieve higher productivity per unit of area than large producers due to their use of intensification, intercropping and higher labour inputs. The kinds of heterogeneous agricultural systems often favoured by smallholders (such as agro-forestry or integrated silvo-pastoral systems) can play a critical role in assuring individual and community subsistence and food security. But for this to happen, the 500 million small and family farmers worldwide (including peasants, indigenous people, traditional communities, fisher folks and



pastoralists) must become again an explicit component of economic and developmental policies and interventions.

### **Legitimacy and Resource Appropriation**

76. Human rights violations are common in the food and agriculture sector in terms of ownership and access to land, water and biodiversity, as well as labour conditions. Extortion and corruption in food and agriculture has led to an increasing shareholder and customer demand for social accountability of enterprises.
77. Governance of tenure has become crucial in recent years. In fact, large-scale land acquisitions by foreign investors involves tens of billions of dollars of investment funds negotiated with little public disclosure. In 2013, 20 to 60 million hectares of farmland (of which at least half are transnational) changed hands in developing countries, often resulting in deforestation and displacement (sometimes even eviction) of local dwellers, especially indigenous people and pastoralists. This trend, coupled with other tenure conflicts (in Africa, only 2-10 percent of total land is formally tenured), has prompted the development of Voluntary Guidelines for the Responsible Governance of Tenure of Land, Fisheries and Forests that determines who can use resources, for how long and under what conditions.

### **Full-Cost Accounting**

78. Triple bottom-line reporting, or the triangle “people, planet and profit”, seeks to strike a balance between social, environmental and economic concerns of stakeholders and shareholders. While historically, external operations effects were not considered in economic decisions, current efforts seek to account for environmental and social externalities and identify dependencies on resources on the verge of being depleted. In July 2016, the Natural Capital Coalition launched the Natural Capital Protocol which includes a sector guide for Foods and Beverages; as part of these efforts, the food and agricultural sector was found to have an environmental cost of about USD 3 trillion per year, or 1.5 times the market cost of the produce.

### **FAO’s Mandate and Sustainability**

79. In 1988, FAO defined sustainable development as “ the management and conservation of the natural 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 agriculture, forestry and fisheries) conserves land, water, plant and animal genetic resources, is environmentally non-degrading, technically appropriate, economically viable and socially acceptable.”

80. FAO Strategic Framework 2000-2019 aims to promote the continuing contribution of food and sustainable agriculture to the attainment of three global inter-related social, economic and environmental goals through:
- reduction of the absolute number of people suffering from hunger, progressively ensuring a world in which all people at all times have sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life;
  - elimination of poverty and the driving forward of economic and social progress for all with increased food production, enhanced rural development and sustainable livelihoods;
  - sustainable management and utilisation of natural resources, including land, water, air, climate and genetic resources, for the benefit of present and future generations.
81. In 2014, FAO published its Sustainable Food and Agriculture principles:
- Improving efficiency in the use of resources is crucial to sustainable agriculture;
  - Sustainability requires direct action to conserve, protect and enhance natural resources;
  - Agriculture that fails to protect and improve rural livelihoods, equity and social well-being is unsustainable;
  - Enhanced resilience of people, communities and ecosystems is key to sustainable agriculture;
  - Sustainable food and agriculture requires responsible and effective governance mechanisms.
82. Sustainability can be evaluated by the sum of the various human/social, economic and natural resources where the degree of use, exchange and trading among them will vary according to the values given to each. The interactions between resources and degree of their substitutability would therefore ultimately depend on acceptability of trade-offs between resources.
83. The question is how to evaluate the trade-offs involved in different possible technologies, systems and development strategies to inform decision-makers and envisage alternative options. The different costs and benefits of development scenarios can be evaluated through multiple criteria models which allow the understanding of social dynamic of farming and resource-use systems and related trade-offs and synergies, in terms of good governance, social wellbeing, economic resilience and environmental integrity. To this end, an integrative framework for the different dimensions of sustainability is necessary.



## Sustainability Assessment of Food and Agriculture Systems (SAFA)

### SAFA Framework for Sustainability

84. In 2009, the FAO Natural Resources Management and Environment Department undertook analytical work with the ISEAL Alliance<sup>1</sup> aimed at identifying and developing a conceptual framework that would be able to capture and render operational a holistic definition of sustainability in the food and agriculture sector, in line with FAO's principles for Sustainable Food and Agriculture (SFA).
85. Building on a broad review of materials, a first conceptual framework was developed and through a participatory process, guidelines were published in 2013 for the so-called SAFA, or Sustainability Assessment of Food and Agriculture systems. In addition to environmental, economic and social sustainability, SAFA includes a "Good Governance" pillar, as issues of transparency, rule of law and participation are considered key components in the credibility of sustainability interventions and critical to the legitimacy of non-governmental actions.
86. The SAFA review started from established sustainability frameworks, drawing notably from the 1987 Brundtland Report, Our Common Future, as since reviewed and up-dated by a variety of UN bodies (e.g. EcoSoc, ILO, UNEP). Normative references from a range of national governments were also analyzed, as well as corporate tools (e.g. WalMart Sustainability Index), NGO tools (e.g. Transparency International, Bellagio STAMP), research materials (e.g. Stiglitz-Sen-Fitoussi Report by the Commission on the Measurement of Economic Performance and Social Progress), as well as social and environmental voluntary standards (e.g. FLO, MSC, Utz Certified), the ITC Standards Map and the ISEAL Code of Good Practice for Assessing Social and Environmental Standards.
87. The resulting framework was articulated around four pillars of sustainability that presents core issues underlying these four pillars: good governance, environmental integrity, economic resilience and social wellbeing. Each of the 21 SAFA Themes has a stated goal which is further disaggregated into sub-themes and indicators relevant for supply chains. SAFA conceptual framework and its subsequent iterations and thus far published products<sup>2</sup>, include the following: SAFA Guidelines version 3.0.(2013); SAFA Indicators (2013); SAFA Desktop Tool version 2.2.40 (2014); and SAFA Smallholders App version 2.0 (2015).
88. SAFA resulted from the review of multiple stakeholder and governmental approaches to sustainability. Furthermore, it was conceptualised and developed by a variety of stakeholders, including academics, experts from the UN system, private enterprises and civil society organizations involved in sustainability

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<sup>1</sup> [www.isealliance.org](http://www.isealliance.org) is a global membership association working on sustainability standards.

<sup>2</sup> See <http://www.fao.org/nr/sustainability/sustainability-assessments-safa>

assessment, as well as expert meetings held in FAO, electronic public reviews, stakeholders and practitioners meetings and extensive piloting and beta testing in all continents, with the participation of a quarter of a million producers of crops, livestock, timber, fish, fibres and beverages. Representatives from all FAO Departments, interested sister agencies such as IFAD, UNCTAD and ITC, and international experts were invited to provide feedback on the approach taken, to assess the benefits and uses for such a framework, and to provide their individual expertise to further elaborating the definition and scope of some of the specific core issues and indicators enshrined in SAFA.

89. A recurring question has been whether it is possible to define a framework applicable to a diversity of users. For example, a Good Governance pillar may seem counter-intuitive for governments. Or for-profit businesses may perceive the proposed framework as primarily relevant for developing countries. Amongst experts consulted, there has been broad agreement that whilst some aspects of sustainability may be less of a priority to address in certain places (e.g. because already delivered), the issues themselves remain nonetheless important for sustainability globally. As a result, SAFA provides a universal framework that can be customized according to different settings and scopes.
90. The SAFA development process was intentionally slow in order to build users' ownership. While stakeholders who do not have a proper sustainability tool have embraced SAFA entirely, the trend has been for large private companies (who already have their own sustainability tool) to include parts of SAFA into their schemes, with a view to better compete with other businesses. Thus, SAFA is steadily fulfilling its universal framework ambition, as private schemes further converge and eventually, harmonize.
91. Furthermore, some countries have used SAFA to create their own decision-making tool, such as done in Argentina, for evaluating different water development options in the Mendoza region, or in New Zealand, for ensuring the sustainability of export commodity groups (i.e. the New Zealand Sustainability Dashboard). In January 2016, the European Parliament approved a Competition Policy<sup>3</sup> that specifically refer to SAFA and calls for the EC to monitor food supply chains in Europe along SAFA's indicators.
92. Since the beginning of the SAFA process in 2009, supply chain companies have been improving their own schemes by using SAFA elements and thus, heightened convergence can be observed throughout sustainability schemes. Since January 2014, the SAFA Tool (for Windows and Mac PC) has been downloaded from the FAO webage by some 600 registered users and since November 2015, the SAFA Smallholders App (for Android phones and tablets) has been downladed by 78 users from Google Store.

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<sup>3</sup> See <http://www.europarl.europa.eu/sides/getDoc.do?type=TA&reference=P8-TA-2016-0004&language=EN&ring=A8-2015-0368>

93. A May 2016 review of SAFA usage revealed that: while SAFA was developed mainly for agri-food enterprises (large and small), the prime users of SAFA tools are graduate students and research institutions (41%), followed by private sector (31%); the most used SAFA resources are the Guidelines (48%), followed by Indicators (25%), Desktop Tool (20%) and finally, the recently launched Smallholders App (7%); SAFA users are equally divided between those who directly use SAFA Indicators, Guidelines, Tool or App (even with adaptations) in order to assess farmers, forestry or fisheries' sustainability – while 52% of SAFA users used SAFA as benchmark to develop their own sustainability assessment system, or for study purposes. For both direct and indirect users, the call to FAO is unanimous: “data” is the most needed resource for benchmarking individual performance and more importantly, assessing the feasibility of improvements in given contexts.

### **SAFA and the Sustainable Development Goals**

94. The overall goal of SAFA is sustainable food and nutrition security. SAFA's Environmental Integrity pillar corresponds mostly with “food availability”, that is the natural resources endowments that determine yields. SAFA's Social Wellbeing pillar corresponds mostly with “access to food”, or the rights of people to the resources necessary for food production or procurement. SAFA's Economic Resilience pillar could be related to the “food utilization” economy that determines value creation and diets. SAFA's Good Governance pillar is related to institutional practices that determine the fairness and consequently, “stability of food systems”.

95. All 17 Sustainable Development Goals (SDG) except one (i.e. SDG9 on Industry, Innovation and Infrastructure) have at least one SDG target that is reflected in SAFA. Similarly, all 21 SAFA Themes except two (i.e. Corporate Ethics and Animal Welfare) correspond to a relevant SDG target.

96. The Table below indicates that:

- The Good Governance pillar of SAFA revolves around understanding corporate governance impact on all affected stakeholders in the supply chain – while the most correspondent SDG16 revolves around strong national and international institutions.
- The Environmental Integrity pillar of SAFA includes all 5 environmentally-oriented SDGs (SDG6 Water, SDG7 Energy, SDG13 Climate, SDG14 Oceans, SDG15 Land) and more, such as consideration of air pollution and animal welfare.
- The Economic Resilience pillar of SAFA has correspondent targets scattered over 7 SDGs: SDG1 Poverty, SDG2 Hunger, SDG3 Health, SDG8 Decent Work and Economic Growth, SDG11 Cities, SDG12 Sustainable Consumption and Production and SDG17 Means of Implementation.
- The Social Wellbeing pillar of SAFA has convergence mostly with SDG 2 Hunger and SDG 8 Decent Work and Economic Growth, as well as relevant targets in other SDGs: SDG1 Poverty, SDG4 Education, SDG5 Gender and SDG16 Institutions.

<b>SAFA THEMES / SUB-THEMES</b>	<b>SDG TARGET</b>
<b>GOOD GOVERNANCE</b>	
Corporate Ethics ➤ Mission Statement ➤ Due Diligence	
Accountability ➤ Holistic Audits ➤ Responsibility ➤ Transparency	16.6 Accountable and transparent institutions
Participation ➤ Stakeholder Dialogue ➤ Grievance Procedures ➤ Conflict Resolution	16.7 Participatory decision-making
Rule of Law ➤ Legitimacy ➤ Remedy, Restoration and Prevention ➤ Civil Responsibility ➤ Resource Appropriation	16.3 Rule of law and justice
Holistic Management ➤ Sustainability Management Plan ➤ Full-Cost Accounting	12.6 Sustainability information in reporting
<b>ENVIRONMENTAL INTEGRITY</b>	
Atmosphere ➤ Greenhouse gases ➤ Air quality	13.3 Climate change capacity
Water ➤ Water Withdrawal ➤ Water Quality	6.4 Water withdrawals 6.3 Water quality; 14.1 Marine pollution
Land ➤ Soil Quality ➤ Land Degradation	2.4 Agricultural practices that improve land 15.3 Desertification and land degradation
Biodiversity ➤ Ecosystem Diversity ➤ Species Diversity ➤ Genetic Diversity	6.6. Water ecosystems; 14.2 Marine ecosystems; 15.1 Terrestrial ecosystems 14.4 Fish stocks; 15.2 Forests; 15.5 Threatened species; 15.c Protected species 2.5 Genetic diversity of seeds and breeds
Materials and Energy ➤ Material Use ➤ Energy Use ➤ Waste Reduction and Disposal	8.4 Resource efficiency 7.2 Renewable energy; 7.3 Energy efficiency 12.3 Food loss and waste of supply chains
Animal Welfare	

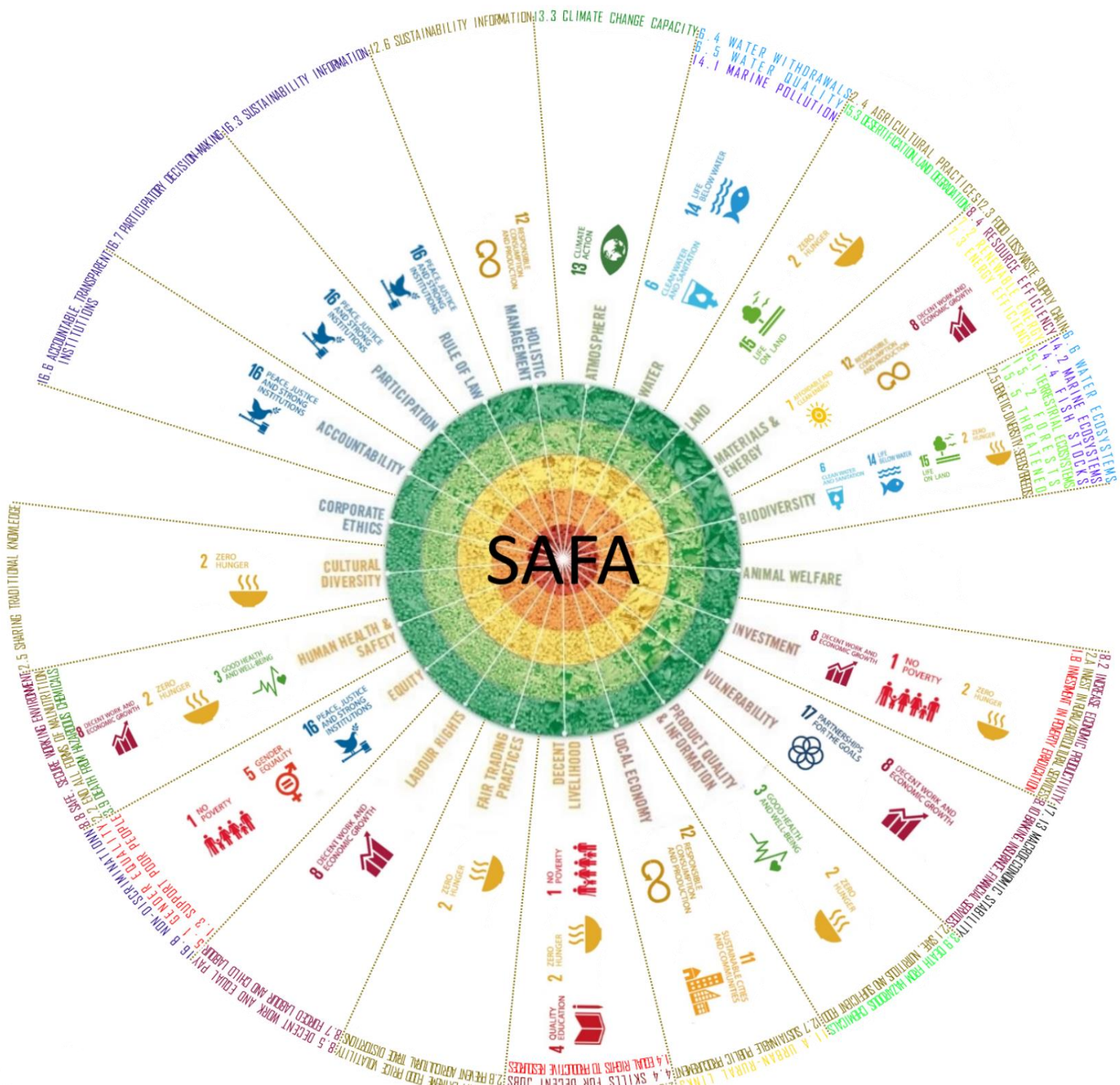
ECONOMIC RESILIENCE	
Investment <ul style="list-style-type: none"> <li>➤ Internal investment</li> <li>➤ Community investment</li> <li>➤ Long-Ranging Investment</li> <li>➤ Profitability</li> </ul>	8.2 Increase economic productivity through diversification, technological upgrading and innovation 2.a Invest in rural and agricultural services 1.b Investment in poverty eradication
Vulnerability <ul style="list-style-type: none"> <li>➤ Stability of Production</li> <li>➤ Stability of Supply</li> <li>➤ Stability of Market</li> <li>➤ Liquidity</li> <li>➤ Risk Management</li> </ul>	17.13 Macroeconomic stability 8.10 Banking, insurance, financial services
Product Quality and Information <ul style="list-style-type: none"> <li>➤ Food Safety</li> <li>➤ Food Quality</li> <li>➤ Product Information</li> </ul>	3.9 Death/illness from hazardous chemicals 2.1 Safe, nutritious and sufficient food for all
Local Economy <ul style="list-style-type: none"> <li>➤ Value Creation</li> <li>➤ Local Procurement</li> </ul>	11.a Urban-rural links and regional develop. 12.7 Sustainable public procurement
SOCIAL WELL-BEING	
Decent Livelihood <ul style="list-style-type: none"> <li>➤ Quality of Life</li> <li>➤ Capacity Development</li> <li>➤ Fair Access to Means of Production</li> </ul>	2.3 Incomes of small-scale producers 4.4 Skills for decent jobs 1.4 Equal rights to productive resources
Fair Trading Practices <ul style="list-style-type: none"> <li>➤ Responsible buyers</li> <li>➤ Rights of Suppliers</li> </ul>	2.c Limit extreme food price volatility 2.b Prevent agricultural trade distortions
Labour Rights <ul style="list-style-type: none"> <li>➤ Employment Relations</li> <li>➤ Forced Labour</li> <li>➤ Child Labour</li> <li>➤ Freedom of Association &amp; Bargaining</li> </ul>	8.5 Decent work and equal pay 8.7. Forced labour and child labour
Equity <ul style="list-style-type: none"> <li>➤ Non-discrimination</li> <li>➤ Gender Equality</li> <li>➤ Support to Vulnerable People</li> </ul>	16.b Non-discrimination 5.1 Gender equality 1.3 Support to poor and vulnerable people
Human Safety and Health <ul style="list-style-type: none"> <li>➤ Workplace Safety &amp; Health Provisions</li> <li>➤ Public Health</li> </ul>	8.8. Safe and secure working environment 2.2. End all forms of malnutrition; 3.9 Health and illness from hazardous chemicals
Cultural Diversity <ul style="list-style-type: none"> <li>➤ Indigenous Knowledge</li> <li>➤ Food Sovereignty</li> </ul>	2.5 Equitable sharing of benefits from traditional knowledge of genetic resources
* <i>SAFA applies to supply chain enterprises</i>	* <i>SDGs apply to national development policies</i>

# Relevance of SAFA Themes to the 2030 Agenda





## SAFA Themes and SDG's Targets



97. The high level of convergence between the SDGs and SAFA are further illustrated in the graphs; where gaps appear, this is due to SAFA's specific scope of measuring enterprises' impacts on value chains, while the SDGs address national policies.
98. It should be noted that the SAFA themes constituting the economic and social pillars of sustainability are inter-changeable. The same applies for the social and governance pillar. In fact, the 21 SAFA themes weight equality in the calculation of the overall sustainability assessment. The ultimate assessment result does not seek to attribute (subjective) values to the different themes, nor to issue a sustainability score (or index) but rather, highlight hotspots that deserve consideration for future improvements; improvements could also take the form of partnerships with institutions having complementary mandates.

### **Towards a Sustainability Information Centre**

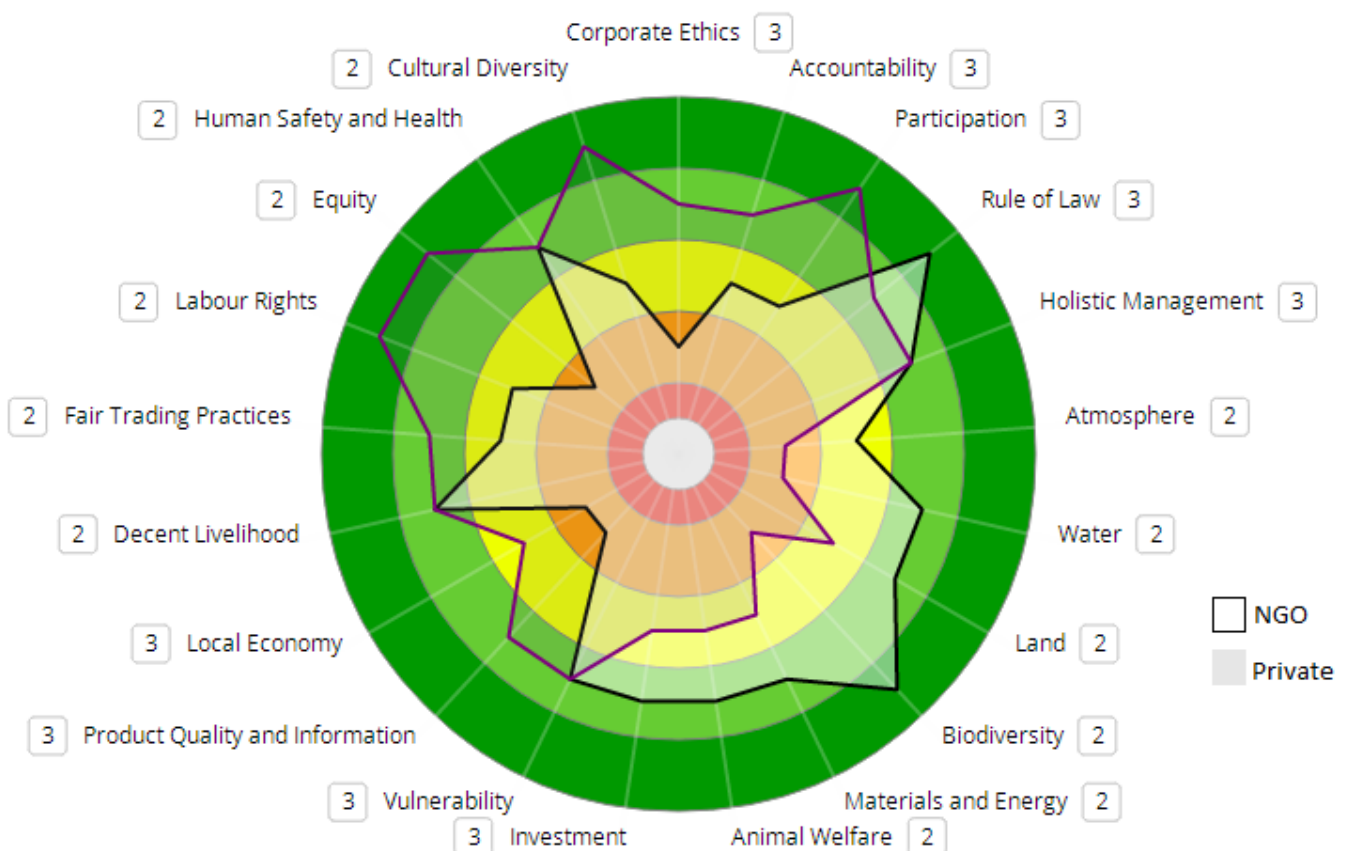
99. For those wishing to assess the most effective interventions for particular sustainability outcomes, there is no central place where sustainability performance is compared and assessed according to a universal definition of attributes and performance.
100. FAO/NRC developed in 2015 the SAFA Database in order to collate feedback of SAFA assessments by public and private organizations and individuals willing to share the results of their SAFA Tool or SAFA App assessments. The SAFA Database allows comparing assessments based on objective sustainability characteristics, shared criteria and indicators. It also facilitates benchmarking of individual user's performance and incrementally enhances collective learning.
101. While currently restricted to FAO's use, the SAFA Database provides a repository of sustainability information that could benefit the global community. The idea of a "Sustainability Information Centre" was triggered by all experts and enterprises involved in SAFA. It was deemed to be a product that would be of great interest and use for many types of stakeholders, including development NGOs, businesses, entities wishing to claim sustainable procurement and indeed, policy-makers who seek to monitor developments within and outside their borders.
102. There is broad recognition that the main challenge lies in analyzing sustainability information, which inherently is location-specific and subjective. One challenge is the legitimacy of how the information is collated, compiled and presented, as it will invariably lead to value assessments between users.
103. An eventual SAFA-fed Sustainability Information Centre could only service stakeholders if backed by a strong partnership of diverse and complementary organisations (e.g. governmental, non-governmental, private sector), besides being led by, and "housed", in a non-partisan international organization, such as FAO, which could also service users with complementary datasets (e.g. FAOSTAT, AQUASTAT, GAEZ).



104. The proposed Sustainability Information Centre, once launched and properly populated with SAFA assessments from all kinds of different settings, will require analysis to assess the inter-linkages and trade-offs between core sustainability issues and different indicators. As the selection of issues by specific users will differ by scale (local, national, global), timeline and stakeholder contexts, such a tool can only be flexible and dynamic, offering scenario visualisations.

105. The SAFA Polygon below is an example of how this could be achieved. It provides a representation of the ways in which two different actors, including a food business and a rural development NGO, may relate to a range of core sustainability issues in a particular context. Accordingly, if an agri-food company seeking sustainability is equipped to achieve good environmental performance but is weak on community development, it may wish to consider working with the local NGO to address these issues, if appropriate. Similarly, if a governmental entity scores well on “biodiversity”, the assessment framework points to the need to be mindful of the impact of this policy on other sustainability dimensions such as “equity” and “local development”.

## SAFA’s Sustainability Polygon



106. The SAFA Polygon, overlaying the different sustainability pillars and core sustainability themes, nesting and linking the different indicators/indices, illustrates the trade-offs between the different elements that compose it. It also allows for the use of both qualitative and quantitative indicators/indices and thus, allows a quick overview of alternative development scenarios where certain issues are preferred among others.
107. Different SAFA Polygons allow visualizing different development scenarios, highlighting strengths and weaknesses of an activity performance along all sustainability dimensions. Ideally, stakeholder meetings, focus groups or other forms of consultation will be required to decide upon the most appropriate sustainability pathway for a given community, depending on available resources and specific values and objectives.

## **Conclusions**

108. The considerations raised in this paper illustrate the urgency of a renewed analysis of how agriculture, forestry and fisheries depend on and impinge upon the sustainability of the world's ecosystems, populations and markets. Without this understanding, there is a high risk of business-as-usual policy-making and implementation having unintended leakage effects on priority sustainability outcomes, as well as continuing to fall short of delivering to global commitments, such as food security.
109. Given the scale of the challenges ahead, new types of collaboration and partnership are necessary. The complementary roles of creatively restructured public agencies (at local, national and international levels), organized civil society and the private sector requires the establishment of structures conducive to good governance for enhanced food security, reduced rural poverty and conserved natural resources. Cooperation is required at all levels and especially among different sectors in order to ensure that agriculture, forestry and fisheries policies are planned and integrated within national development strategies and complementary to trade, environment, climate and energy policies, to name but a few policy areas. More importantly, policies must reward sustainability and support continuous improvements.
110. Managing performance across the different governance, environmental, social and economic dimensions of life requires integrated analytical tools. SAFA offers such a tool. SAFA resources are already filling a gap by providing universal, multi-purpose and free self-assessment tools and the establishment of a "Sustainability Information Centre" would greatly increment current efforts to progress towards more sustainable operations.
111. As leading Organization for a sector (food and agriculture) that is at the heart of most sustainability goals, FAO can foster cross-sectoral and cross-institutional synergy with sister UN organizations, other relevant multilateral and international organisations, as well as leading experts from the non-governmental, voluntary sectors, private sectors and academia, in support of the Sustainable Development Goals.

## References

- Barbier, E. B., 2009.** A Global Green New Deal Prepared for the Economics and Trade Branch, Division of Technology, Industry and Economics. UNEP.
- Bellemare, M., 2010.** As You Sow, So Shall You Reap: The Welfare Impacts of Contract Farming. MPRA Paper 23638, University Library of Munich, Germany.
- Brown O., Crawford A. and Gibson J., 2008.** Boom or Bust: How Commodity Price Volatility Impedes Poverty Reduction and What to do About it. IISD.
- Bruinsma, J., 2009.** The Resource Outlook to 2050: by How Much do Land, Water and Crop Yields Need to Increase by 2050?. Economic and Social Development. FAO, June 2009.
- Clay, J., 2004.** World Agriculture and the Environment.
- Cooper, T., Hart, K. and Baldock, D., 2009.** The Provision of Public Goods Through Agriculture in the European Union.
- Diamond, J., 2005.** Collapse: How Societies Choose to Fail or Succeed.
- European Environmental Agency, 2002.** Agriculture Eco-Efficiency.
- ETC, 2015.** Breaking Bad: Big Ag Mega-Mergers in Play. ETC Group Communiqué 115. December 2015.
- FiBL, IFOAM, 2016.** The World of Organic Agriculture. Statistics and Emerging Trends 2016.
- Gates Foundation, 2009.** Framework for Addressing Land Access in Agricultural Development Strategies and Grants. Presentation 27 October 2009.
- Grootaert C. and Van Bastelaer W., 2002.** Understanding and Measuring Social Capital - A Synthesis of Findings and Recommendations from the Social Capital Initiative.
- Gudmundsson, E. Asche, F. Nielsen, M., 2006.** Revenue Distribution Through the Seafood Value Chain. FAO Fisheries Circular. No. 1019.
- FAO, 2007.** Environment and Agriculture. 12<sup>th</sup> Session of the Committee on Agriculture, FAO.
- FAO, 2009.** The State of Food Insecurity in the World – Economic Crises: Impacts and Lessons Learned.
- FAO, 2009.** Gender Equity in Agriculture and Rural Development: A quick Guide to Gender Mainstreaming in FAO's New Strategic Framework.
- FAO, 2012.** Greening the Economy with Agriculture.
- FAO, 2013.** Sustainability Assessment of Food and Agriculture systems (SAFA) Guidelines. Version 3.0.

**FAO, 2013.** Sustainability Assessment of Food and Agriculture systems (SAFA) Indicators.

**FAO, 2013.** Food Wastage Footprint: Impacts on Natural Resources.

**FAO, 2013.** Indigenous Peoples' food systems& well-being interventions & policies for healthy communities

**FAO, 2014.** Food Wastage Footprint: Full-Cost Accounting.

**FAO, 2014.** User Manual. Sustainability Assessment of Food and Agriculture systems (SAFA) Tool. Version 2.2.40.

**FAO, 2015.** User Manual. Sustainability Assessment of Food and Agriculture systems (SAFA) Smallholders App. Version 2.0.0.

**FAO, 2015.** Natural Capital Impacts in Agriculture: Supporting Better Business Decision-Making.

**FAO, 2015.** The State of Food Insecurity in the World 2015. Meeting the 2015 International Hunger Targets: Taking Stock of Uneven Progress.

**FAO, 2015.** FAO and the 17 Sustainable Development Goals.

**FAO, 2015.** Global Forest Resources Assessment 2015.

**FAO, IFAD and WFP, 2015.** The State of Food Insecurity in the World 2015. Meeting the 2015 international hunger targets: taking stock of uneven progress. Rome, FAO.

**Guttenstein E., El-Hage Scialabba N., Loh J. and Courville S., 2010.** Conceptual Framework on Delivering Sustainability. FAO, August 2010.

**Heemskerk, W. and Wennink, B, 2005.** Stakeholder-Driven Funding Mechanisms for Agricultural Innovation: Case studies from Sub-Saharan Africa.

**Hoekstra, A.Y., 2010.** The Water Footprint: Water in the Supply Chain. The Environmentalist, 93: 12-13.

**IAASTD, 2008.** Business as Usual Is Not an Option: The Role of Institutions. International Assessment of Agricultural Science, Technology and Development.

**IAASTD, 2008.** Business as Usual Is Not an Option: Trade and Markets. International Assessment of Agricultural Science, Technology and Development.

**IAASTD, 2009.** Agriculture at a Crossroads: Global Report. International Assessment of Agricultural Science, Technology and Development.

**ILO, 2015.** Ratifications of C184 - Safety and Health in Agriculture Convention

**ILO-IPEC, 2013.** Marking progress against child labour - Global estimates and trends 2000-2012.

**ISEAL, 2008.** R079 Governmental Use of Voluntary Standards: Innovation in Sustainability Governance. ISEAL Alliance.

**Jaworski, P. , Eisbrenner K., Meyer S., Dehue B., 2009.** Climate Standards for Agriculture, Forestry and Fisheries. FAO/NRD, June 2009.

**Longley, S., 2009.** Agricultural Workers Still Struggle for their Rights. Seedlings.

**Millstone, E. and Lang, T., 2003.** The Atlas of Food – Who Eats What, Where and Why.

**Nellemann, C. et al., 2009.** Blue Carbon – The Role of Healthy Oceans in Binding Carbon

**Sachs, J., 2008.** Common Wealth – Economics for a Crowded Planet

**UNICEF, World Health Organization 2015.** Progress on sanitation and drinking water – 2015 update and MDG assessment.

**UNPFII, 2010.** State of the Worlds Indigenous People.

**WHO, 2000.** The World health report 2000: health systems: improving performance.

**Wild, S. et al , 2004.** Global Prevalence of Diabetes – Estimates for the Year 2000 and Projections for 2030.

**World Bank, 2008.** World Development Report 2008: Agriculture *for* Development.

**WWF, 2008.** Living Planet Report 2006 and 2008.

**WWF, 2009.** Smallholder Agriculture and the Environment in a Changing Global Context. WWF Macroeconomics Programme.