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COMMITTEE ON AGRICULTURE

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Sustainable Production Intensification and Sustainable Food Systems

Executive Summary

In 2010 and 2012, the Committee on Agriculture (COAG) supported the FAO Strategy for Sustainable Production Intensification (SPI) and recommended broadening it beyond crops in a holistic systems approach.

FAO's new Strategic Framework addresses the Committee's recommendation to enlarge the consideration of sustainable agricultural production towards food chains, sustainable diets and ultimately sustainable food systems. Strategic Objective 2 focuses on the sustainable intensification of agricultural production. Strategic Objective 4 centres on more inclusive and sustainable food value chains, including reducing food losses and waste, and greening food value chains, while ensuring that the development of voluntary standards does not limit access to markets for small-scale actors and developing countries.

The paper briefly reports on some of the work of FAO in support of sustainable food systems since 2012, focusing on the following areas: developing a common vision on sustainable food and agriculture; implementing SPI; promoting Sustainable Food Value Chains; reducing food waste and losses; and the FAO-UNEP Sustainable Food Systems Programme.

Suggested action by the Committee

The Committee is invited to:

- a) Support FAO's work on local adaptation of SPI practices, sustainable value chains, voluntary standards and methodologies to assess and reduce food losses and waste in support of sustainable food systems;
- b) Recommend that FAO further integrate its work on the sustainability of food systems, including the development of a programme on sustainable food systems to be integrated in the Ten-Year Framework of Programmes on Sustainable Consumption and Production (10YFP-SCP).



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I. Introduction

1. At its 22nd Session in 2010, the Committee on Agriculture (COAG) supported the FAO Strategy for Sustainable Crop Production Intensification (SCPI) and stressed that *the implementation of the strategy requires an integrated holistic approach with social, economic and ecological dimensions (ecosystem services), and that crop production should be seen in the context of the overall food chain.*¹ It pointed out the need for a broad range of partnerships. In 2012, at its 23rd Session, the Committee *noted the progress made in the implementation of the Strategy and the importance of a holistic approach that integrates economic, social and environmental sustainability to production including the need for complementary actions along the food chains and sustainable diets*², and reaffirmed support for the Strategy with the revised title of Sustainable Production Intensification (SPI).

2. The notion of sustainable food systems, including the relationships between the sustainability of food systems and food security and nutrition, developed gradually. The work of FAO, together with other Rome-based agencies, has been instrumental in this process, particularly in the preparations for the Rio+20 Conference and since the launch of the Zero Hunger Challenge presented by the United Nations Secretary-General in Rio. The High Level Panel of Experts for food security and nutrition has recently coined an integrated definition, whereby *“a sustainable food system (SFS) is a food system that delivers food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised”*.³

3. Thus intended, sustainable food systems cover a very broad range of issues and related FAO work. FAO’s new Strategic Framework addresses the Committee’s recommendation to enlarge the consideration of sustainable agricultural production towards food chains, sustainable diets and ultimately sustainable food systems. The sustainable intensification production concept, as formalized for crop production in *Save and Grow*, provides a way to embrace the topic progressively, from a production perspective, in Strategic Objective 2 on the sustainable intensification of agricultural production, and in Strategic Objective 4 on more inclusive and sustainable food value chains, including reducing food losses and waste, and greening food value chains. It also enables to address the relation between sustainable consumption and sustainable production, as with voluntary standards, in SO4; and as part of policies linked to sustainable consumption and production and food security in SO1.

4. The paper briefly reports on some of the work of FAO in support of sustainable food systems since 2012, focusing on the following areas: i) developing a common vision on sustainable food and agriculture; ii) implementing SPI; iii) promoting Sustainable Food Value Chains; (iv) reducing food waste and losses; and v) the joint FAO-UNEP⁴ Sustainable Food Systems Programme.

5. COAG’s guidance is sought on key priority areas of work for 2014–2017 focused on integrated holistic approaches to developing sustainable production intensification and sustainable food systems.

II. Developing a common vision on sustainable food and agriculture

6. In the process of creating the conceptual basis, theory of change and work programme for SO2, it became clear that a common vision and coordinated approach to working on sustainable food and agriculture (SFA) was needed in FAO. To this end, a cross-departmental SFA group was instituted to take stock of the Organization’s approach and experience in promoting sustainable food and

¹ Report of the 22nd Session of the Committee on Agriculture, paragraphs 7–8 (CL140/3-C2011/17).

² Report of the 23rd Session of the Committee on Agriculture (C 2013/22).

³ HLPE, 2014. Food losses and waste in the context of sustainable food systems. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome 2014 (http://www.fao.org/fileadmin/user_upload/hlpe/hlpe_documents/HLPE_Reports/HLPE-Report-8_EN.pdf).

⁴ United Nations Environment Programme (UNEP).

agriculture, building upon these to develop a common vision to guide future work. The results of the first phase of this work were published in the FAO document "Vision, principles and approaches"⁵.

7. Five principles to guide actions supporting transition to SFA were identified, balancing the social, economic and environmental dimensions of food and agriculture systems, recognizing the need to increase productivity through improved efficiency in the use of resources and the interactions within and across crop, livestock, fishery and forestry sectors. These principles are:

- a) improving efficiency in the use of resources;
- b) direct action to conserve, protect and enhance natural resources;
- c) protect rural livelihoods and improve equity and social well-being;
- d) enhance the resilience of people, communities and ecosystems, especially to climate change and market volatility;
- e) good governance as an essential element for sustainable natural and human systems.

8. The SFA process also yielded proposals for enhancing coordination of work on sustainable food and agriculture within FAO, which are currently being implemented. Working with partner countries to pilot the approach is one of the main activities. In 2014-2015 FAO will be working with Bangladesh, Burkina Faso, Morocco and Rwanda to develop strategies for enhancing sustainability in food and agricultural systems, suited to the specific needs of the country, and using a coordinated approach across FAO departments/units. The process is designed to help countries:

- identify the main sustainability issues in agricultural and natural resource-based production systems, and set priorities for action;
- promote dialogue among key national stakeholders across agricultural and natural resources sectors in order to encourage a common vision of a sustainable future; and
- implement initiatives, programmes or projects that address priority areas.

9. This learning-by-doing approach will shed light on how to coordinate work better between stakeholders at country level and is expected to improve FAO's support to member countries. Lessons learnt will help further extend the effort to other countries.

10. Additional proposals of the SFA group include producing a flagship publication to further elaborate the FAO vision and coordinated approach to SFA, as well as dialogue and communication activities to be implemented throughout the Organization.

III. Implementing Sustainable Production Intensification (SPI)

11. FAO's Strategic Objective 2, *increase and improve provision of goods and services from agriculture, forestry and fisheries in a sustainable manner*, is the main mechanism for the delivery of the work on SPI. It builds on, and adds to, the Save and Grow paradigm – the enabling framework for producing “more with less”, from the same area of land while conserving resources, reducing negative impact on the environment and enhancing natural capital and the flow of ecosystem services.

12. In follow-up to the 23rd Session of COAG, actions undertaken in support of the Strategy on SPI are clustered according to the following five themes.

1) *Awareness-raising initiatives for the Save and Grow approach (SPI)*

- Development and dissemination of advocacy factsheets on farming systems, crops and varieties, water management, soil health-promoting technologies and plant protection approaches, along with guides to the practical application, with *Save and Grow Cassava* and *Good Practices for Greenhouse Vegetable Crops*.⁶
- Publication of lessons learnt and guidance on implementing SPI, including such elements as conservation agriculture, pollinator deficits and management, case studies from Farmer Field

⁵ <http://www.fao.org/3/a-i3940e.html>

⁶ www.fao.org/ag/save-and-grow

Schools (FFS), seed policy formulation, perennial cropping systems and sustainable weed management.

- Organization of a number of international fora and regional consultations to inform development partners about the importance of coherent, implementable strategies on SPI, and identify opportunities for partnerships and synergies in upscaling SPI application.⁷
- Development of a regional plan for agro-environmental standards of sustainability in Latin America and the Caribbean, sponsored by Brazil.⁸

2) *Integrating projects and policy assistance to promote SPI*

13. The Regional Rice Initiative (RRI) in Asia under Strategic Objective 2 is an example of countries working together to promote integrated approaches to SPI. The Initiative, launched in 2013, is testing and validating approaches for Sustainable Rice Production Intensification from field to policy level in Indonesia, the Lao People's Democratic Republic and the Philippines.⁹ Save and Grow for rice was field tested in FFS, in support of strengthening National Rice Strategies.¹⁰

14. Responding to priorities identified in their Country Programming Frameworks, Benin, Burundi, Cameroon, the Democratic Republic of the Congo, the Gambia, Madagascar and the Niger are developing national strategies for diversification and sustainable intensification of their fruit and vegetable sectors, with linkages to water use efficiency and nutritional improvement.

15. Integrated Pest Management (IPM) is essential to SPI and addresses aspects of crop production and protection. FAO's technical support for the dissemination, adaptation and adoption of IPM has continued to evolve through the use of FFS approach with new projects initiated in several African countries and the ongoing work in Asia, Latin America, the Near East and West Africa.

16. Cross-sectoral projects to increase farmers' resilience to climate variability have addressed, *inter-alia*, integrated production and protection through FFS in West Africa, and help establish local seed enterprises for better utilization of local crops and varieties in Africa, Central and Latin America. Countries such as Madagascar are also working with FAO on strengthening resilience to natural disasters by adapting cropping patterns and reinforcing the maintenance and access to local planting materials and seeds.

3) *Developing national strategies for plant genetic resources for food and agriculture (PGRFA)*

17. In the framework of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture (PGRFA), seven countries in the Southern Africa Development Community (SADC) are working with FAO to develop national PGRFA strategies. Responding to the need for quality seed, which is key to successful SPI, broad-ranging partnerships are being sought in the public and private sectors to support the emergence of viable seed enterprises through capacity-building activities on policy formulation and seed sector development.

18. The portfolio of Global Environment Facility-supported programmes for mainstreaming agricultural biodiversity conservation and use is steadily increasing, with one new global and four national projects approved.

4) *Applying the SPI principles and the approach to sustainable livestock development*

19. Sustainable Intensification is also pursued through the Global Agenda for Sustainable Livestock (see COAG/2014/9).

⁷ These included regional consultations on SCPI/Save and Grow organized by FAO respectively in Barbados, in October 2012, with countries of the Caribbean; in Santiago, Chile, in November 2012, with countries of Latin America; and at UN HQ in Geneva, in November 2013, with a wide audience of development partners, aid agencies, the private sector and civil society.

⁸ Project: GCP/RLA/195/ BRA - Strengthening agro-environmental policies in Latin America and the Caribbean through dialogue and exchange of national experiences

⁹ The Multiple Goods and Services of Asian Rice Production Systems. <http://www.fao.org/3/a-i3605e.pdf>

¹⁰ <http://www.fao.org/bodies/council/cl149/side-events/regional-rice-initiative/en/>

20. Integrated plant/animal systems have the potential to improve the sustainability of food production by increasing resource use efficiency, increasing income and providing stability through diversification, as well as providing more balanced and nutritious diets.
21. Rice-fish farming provides additional food and income by diversifying farm activities and increasing yields of both rice and fish, with reduced use of inputs. Capacity building with increased knowledge and improved management techniques for farming households and extension agents will be critically important. A training manual for rice-fish FFS has been developed in Latin America and is currently being tested in field activities in Burkina Faso and Mali. Strong interest has been shown by several other sub-Saharan countries, including the Democratic Republic of the Congo, Senegal, the United Republic of Tanzania and Zambia.
22. The integration of plant and animal production can also be pursued along food chains in order to better valorize by-products and side streams (see section IV).

5) *SPI and Climate Smart Agriculture*

23. The principles of SPI were also key in the development of the Climate Smart Agriculture (CSA) approach.
24. Climate Smart Agriculture has been promoted by FAO as a way forward for food security in a changing climate. This approach integrates the three dimensions of sustainable development (economic, social and environmental) by jointly addressing food security and climate challenges. Local conditions and national priorities determine how the objectives are prioritized or balanced in any CSA strategy, however the basic principle of SPI is broadly applicable in meeting all of them.
25. Food systems have to become, at the same time, more efficient and resilient, at every scale from the farm to the global level. They have to become more efficient in resource use (use less land, water, and inputs to produce more food in a sustainable manner) and become more resilient to changes and shocks. CSA aims to improve food security, help communities adapt to climate change and contribute to climate change mitigation by adopting appropriate practices, developing enabling policies and institutions and mobilizing needed finances.
26. To achieve these objectives, CSA builds upon the principles and practices developed for sustainable intensification of crop production ("Save and Grow"), and expands them to all agriculture sectors. It further emphasizes the need for proper assessments of current and future climate risks and impacts, and of practices, policies and institutions and finances which are needed to achieve transformational change.

IV. Promoting sustainable food value chains

27. The following section briefly reports on activities on sustainable and "green" food value chains and on voluntary standards for sustainability.

1) *Sustainable and "green" food value chains*

28. The term Value Chain (VC) refers to the series of transactions and value addition practices that occur as an agricultural product moves from the producer to the consumer. FAO supports the development of sustainable and green food VCs that include smallholder farmers and small- and medium-size agro-enterprises (SMAEs) through a combination of capacity building, knowledge dissemination, partnership promotion and policy dialogue initiatives.
29. Promoting a green food VC can provide new opportunities for developing food value chains that are economically viable and provide for employment opportunities and other social benefits. For example, food VCs generate co-products, side streams and food losses at all stages. The value of these by-products may be *recaptured* by selling them in alternative markets, such as animal feed or energy markets, thus improving the environmental and economic efficiency of the system. FAO has been promoting various feed processing and supplementation techniques to enhance efficient utilization of crop by-products resulting in increased animal productivity, reduced waste and pollution and enhanced

profitability¹¹. Opportunities for using co-products of the biofuel industry as livestock feed have been identified¹² and guidelines for their safe and efficient use developed. An expert meeting, planned for later this year will identify critical areas that require not only awareness-raising and technical assistance within FAO member countries, but also support in developing public sector capacity to promote sustainable and green VCs.

2) *Determining the contributions of voluntary standards to sustainable food systems*

30. At its 22nd session in 2010, the Committee recommended that a study of the impact of private standards on smallholder market participation be undertaken. In response FAO has undertaken three studies. A global survey¹³ in 2011–2012 on (private) voluntary standards in the livestock sector; an analysis of 17 field projects involving 36 countries that provided technical assistance on voluntary standards between 2004 and 2013¹⁴ and a literature review based on the analysis of 123 cases documented in 101 publications¹⁵, published in 2014.

31. Although the evidence of the impact of voluntary standards on smallholder market access is weak, these studies led to the following conclusions. Voluntary standards:

- a) work within existing institutional frameworks and market relationships and their impact is highly context-specific;
- b) may benefit stakeholders who seek product differentiation and consumers who seek extra assurance of product quality and traceability;
- c) may bring some price increases for farmers, but also incur additional costs;
- d) may restrict smallholders access to markets if they are not efficiently organized and supported; and
- e) may be supported by the public sector through partnering with non-governmental organizations (NGOs) and the private sector to provide support services to farmers, and by improving the national food quality and safety systems and institutions.

32. Finally, as voluntary standards define technical requirements for production and processing, it is important to improve our understanding of how they might be used as incentives for the implementation of sustainable practices.

33. The United Nations Forum for Sustainability Standards (UNFSS) was established in 2012 with the goal of making voluntary standards a driver of, rather than an obstacle to, sustainable development in developing countries. The UNFSS provides a platform for international multistakeholder dialogue on voluntary standards, to develop analytical and empirical work on voluntary standards and provide policy advice to member countries. One initiative is the development of a set of tools for decision-makers.

¹¹ FAO. 2012. Crop residue based densified total mixed ration – A user-friendly approach to utilise food crop by-products for ruminant production, by T.K. Walli, M.R. Garg & Harinder P.S. Makkar. FAO Animal Production and Health Paper No. 172. Rome, Italy. (<http://www.fao.org/docrep/015/i2728e/i2728e00.pdf>). FAO. 2012. Balanced feeding for improving livestock productivity – Increase in milk production and nutrient use efficiency and decrease in methane emission, by M.R. Garg. FAO Animal Production and Health Paper No. 173. Rome, Italy. (<http://www.fao.org/docrep/016/i3014e/i3014e00.pdf>). Utilization of fruit and vegetable wastes as livestock feed and as substrates for generation of other value-added products FAO 2013. (<http://www.fao.org/docrep/018/i3273e/i3273e.pdf>)

¹² Biofuel co-products as livestock feed. Opportunities and challenges FAO 2013. (<http://www.fao.org/docrep/016/i3009e/i3009e00.htm>)

¹³ Survey on (private) voluntary standards in the livestock sector. In: Voluntary Standards for Sustainable Food Systems: Challenges and Opportunities (<http://www.fao.org/docrep/019/i3421e/i3421e.pdf>)

¹⁴ Lessons learned from field projects on voluntary standards: synthesis of results. In *Voluntary standards for sustainable food systems: challenges and opportunities* (<http://www.fao.org/docrep/019/i3421e/i3421e.pdf>), covering projects in Argentina, Benin, Bolivia, Brazil, Burkina Faso, Cameroon, Chile, Costa Rica, Croatia, Ecuador, Guatemala, Guinea, Mali, Mauritania, Morocco, Niger, 12 Pacific island countries in the Pacific Community (PC) and territories, Peru, Senegal, Sierra Leone, the Syrian Arab Republic and Tunisia.

¹⁵ FAO. 2014. *Impact of international voluntary standards on smallholder market participation in developing countries – a review of the literature*. Rome (<http://www.fao.org/3/a-i3682e.pdf>).

34. Working through the UNFSS and directly with the countries, FAO is supporting governments in informed decision-making on the types of voluntary standards that suit national development priorities. FAO has a comparative advantage in this area through its experience in standard setting with *Codex Alimentarius*, as well as in managing multistakeholder initiatives.

V. Reducing food losses and waste

35. As much as one third of food may be lost or wasted along the value chain depending on the specific conditions in a country¹⁶. Losses¹⁷ result from limitations in harvesting techniques, storage, transportation, processing, infrastructure, packaging and marketing systems. In general low-income countries experience higher levels of losses compared with medium- and higher-income countries where food waste is caused mainly by consumer behaviour, customs and habits, retail practices, and inadequate policy and regulatory instruments. Food waste is an issue of growing importance in low-income countries as a function of increased urbanization and changes in lifestyle. Food losses and waste also represent significant losses in water and land resources used for production while contributing to greenhouse gas emissions. For poor smallholder producers, physical losses result directly in less food being available and thus contribute to food and nutrition insecurity. Loss of food quality may also cause reduced nutritional status, economic value, and safety.

36. FAO is actively engaged in implementing the Global Initiative on Food Loss and Waste Reduction or “Save Food”¹⁸ through Strategic Objective 4. The approach taken is to improve in a holistic way the efficiency and sustainability of the entire food supply chain in line with efforts to promote sustainable food systems and sustainable nutrition. The Initiative puts emphasis on measures to prevent and reduce food losses and waste, and then to reuse and recycle the food that is still lost and wasted. In each case, attention is given to ensure that the measures adopted are cost-effective, environmentally friendly and socially acceptable, especially from the gender perspective. A multidisciplinary approach is taken, with the involvement of FAO divisions with expertise in: agricultural and fisheries production, processing and marketing; consumer protection and nutrition; nuclear applications such as food irradiation; natural resources; economic and policy development and social protection; statistics; and communication and partnerships. Strategies developed are tailored to the specific needs of regions, subregions and countries, in collaboration with the FAO regional and liaison offices.

VI. The FAO/UNEP Programme on Sustainable food systems

37. At the Rio+20 Conference in 2012, a Ten-Year Framework of Programmes on Sustainable Consumption and Production (10YFP-SCP) was adopted to enhance international cooperation to accelerate the shift towards sustainable consumption and production in both developed and developing countries. Food systems are a priority area of interest.

38. The Sustainable Food Systems Programme (SFSP), established by FAO and UNEP in 2011 with the support of the Government of Switzerland, is catalysing, through the Agrifood Task Force¹⁹, partnerships among United Nations agencies, other international agencies, governments, industry and civil society whose activities can promote the necessary transition of food systems to sustainability.

39. The overall objective of the SFSP is to add value by bringing together various initiatives and workstreams, in FAO and with partners to build capacity for the uptake of more sustainable

¹⁶ FAO. 2011. *Global food losses and food waste: Extent, Causes and Prevention*, by J. Gustavsson, C. Cederberg, U. Sonesson, R. van Otterdijk and A. Meybeck.

¹⁷ For a definition and scope of losses see http://www.fao.org/fileadmin/user_upload/save-food/PDF/FLW_Definition_and_Scope_2014.pdf

¹⁸ Further details of the Save Food initiative may be found at <http://www.save-food.org>.

¹⁹ The Agrofood Task Force on SCP comprises representatives of States (Barbados, Brazil, China, Costa Rica, Ghana, India, Indonesia, Kazakhstan, Morocco, Netherlands, New Zealand, Switzerland, UK, South Africa, USA), UN Agencies and Programmes (FAO, IFAD, UNCTAD, UNEP, UNIDO), the European Commission, civil society organizations (WWF, IUCN, ISEAL, World Farmers’ Organization), and international business organizations representing 325 firms (SAI, CropLife International) as well as the European SCP Round Table.

consumption and production (SCP) practices across food systems and develop new multistakeholder engagement to build synergies and cooperation towards mutual objectives.

40. Four main working areas have been identified: (i) develop and enhance information platforms on agrifood products and sustainable food systems; (ii) reliable and sustainable communication of food product information throughout the supply chain; (iii) creating the enabling conditions for uptake of sustainable production; and (iv) market-based approaches.

41. The programme contributes to global processes on SCP to better integrate the specificities of the agriculture sectors and organizes events bringing together various initiatives of FAO and its partners, such as the Conference “Towards Sustainable Food Systems: Multistakeholder engagement for Action”²⁰ organized in 2013 during World Food Week, as well as workshops to bring together these various sources of knowledge. The first one²¹ contributed to the workstream on voluntary standards. The second, in 2014, was dedicated to knowledge for sustainable food systems.

42. The programme supports countries in organizing national round tables on sustainable consumption and production in the agrifood sector, with three round tables organized by Ghana, Mozambique and South Africa.

43. In line with its focus on the relationship between consumption and production, the programme has developed activities on sustainable diets, in partnership with the International Centre for Advanced Mediterranean Studies (CIHEAM) and with the Youth and United Nations Global Alliance (YUNGA) programme. It also provides support to the Save Food Initiative on the aspects linked to consumption and consumer behaviour.

44. This work has led to the approval of a preliminary proposal by the 10YFP-SCP Board for the inclusion of a programme on sustainable food systems in the 10YFP-SCP.

VII. Conclusion and guidance sought from the Committee

45. These examples of workstreams focusing on specific aspects of sustainable food systems confirm the need for technical work, as well as to further broaden the approach and ensure proper links between issues. They also emphasize the need to account for regional, national and sectoral specificities and priorities. The challenge is therefore to focus on priorities, often with very specific entry points, while simultaneously adopting a systemic approach, combining agronomic, landscape and food chain considerations; and taking into account the three dimensions of sustainability in their relations to food security and nutrition.

46. The Committee is invited to:

- a) Support FAO’s work on local adaptation of SPI practices, sustainable value chains, voluntary standards and methodologies to assess and reduce food losses and waste in support of sustainable food systems;
- b) Recommend that FAO further integrate its work on the sustainability of food systems, including the development of a programme on sustainable food systems to be integrated in the Ten-Year Framework of Programmes on Sustainable Consumption and Production (10YFP-SCP).

²⁰ http://www.fao.org/fileadmin/templates/ags/docs/SFCP/towards_sustainable_food_systems_website.pdf

²¹ *Voluntary standards for sustainable food systems: challenges and opportunities* (<http://www.fao.org/docrep/019/i3421e/i3421e.pdf>).