منظمة الأغذية والزراعة للأمم المتحدة | 联合国粮食及农业组织 | Food and Agriculture Organization of the United Nations | Organisation des Nations Unies pour l'alimentation et l'agriculture | Продовольственная и сельскохозяйственная организация Объединенных Наций | Organización de las Naciones Unidas para la Alimentación y la Agricultura

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Submission by the Food and Agriculture Organization of the United Nations (FAO)
To the United Nations Framework Convention on Climate Change (UNFCCC)
In relation to the Koronivia joint work on agriculture (4/CP.23)

FAO welcomes the historic decision 4/CP.23, Koronivia Joint Work on Agriculture, which emphasises the key role of agriculture and food security on the international climate agenda. This decision will facilitate concrete progress on '*the fundamental priority of safeguarding food security and ending hunger, and the particular vulnerabilities of food production systems to the adverse impacts of climate change*' as recognized in the preamble of the Paris Agreement (FCCC/CP/2015/L.9/Rev,1). Given its wealth of knowledge and technical expertise, and considering that climate change cuts across all its areas of work, FAO welcomes the opportunity to support Parties in the development of the Koronivia Joint Work on Agriculture under the joint SBSTA and SBI Agenda item.

The food and agricultural sectors[a] are essential for human development and are at the center of the global response to climate change. Agriculture and food systems[b] are particularly vulnerable to the impacts of climate change. At the same time, they are significant contributors to greenhouse gas (GHG) emissions but are also a fundamental part of the solution to tackle climate change. Agriculture is in fact uniquely placed to help countries to deliver on both climate goals and the 2030 Agenda for Sustainable Development.

The goals of FAO are to eliminate hunger, food insecurity and malnutrition, reduce rural poverty, and make the agricultural sectors more productive and sustainable. FAO recognizes that these goals cannot be fulfilled without decisive action on climate change, and climate change cannot be addressed without sustainably managing the world's natural resources and agriculture and food systems. FAO is therefore committed to support developing countries to achieve their Nationally Determined Contributions (NDCs), which are at the heart of the Paris Agreement, and to achieve their long-term development goals as part of the 2030 Agenda. As a response the FAO Strategy on Climate Change[1] focuses on enhancing the institutional and technical capacities of its Member States to achieve their commitments with respect to the agricultural sectors and food security. FAO is pleased to contribute to the Koronivia Joint Work on Agriculture under each of the six elements of work as outlined below:

a) Modalities for implementation of the outcomes of the five in-session workshops on issues related to agriculture and other future topics that may arise from this work

FAO notes that the five SBSTA in-session workshops on '*issues relating to agriculture*', held from 2013 to 2016, facilitated the exchange and the identification of specific countries' gaps and needs regarding agriculture and climate change. FAO actively participated and shared its technical expertise in these workshops (Annex 1). The in-session workshops have highlighted, among other issues, the importance of:

- Facilitating knowledge sharing and exchange of information on good practices and lessons learned, possibly through a web platform.
- Enhancing access to climate finance of the agricultural sectors in least developed and developing countries.

[a] For the purposes of this document, the 'agricultural sectors' are understood to comprise crops, livestock, fisheries and aquaculture, forestry.
[b] For the purposes of this document, the 'agriculture and food systems' are understood as a set of activities ranging from production to consumption.

FAO suggests supporting the implementation of outcomes that are part of the in-session workshops by capitalizing on existing knowledge products and the wealth of its experience and expertise in the agricultural sectors, with the following highlights:

- FAO is developing *a knowledge platform for sharing information and expertise,* with explicit linkages to increased sustainable agricultural production and food security. The platform will facilitate capacity development through peer-to-peer learning and provide access to effective tools and knowledge resources.
- Under the NDC Partnership FAO has established, and facilitates the *Thematic Working Group on Agriculture, Food Security and Land Use* which provides an important forum to exchange information, experts, best practices and technology transfer, as well as to identify further support needs in agricultural sectors.
- FAO continues to *mobilize climate finance for the agricultural sectors* by assisting countries to access resources from the Green Climate Fund (GCF) and the Global Environment Facility (GEF) as well as other partners including the European Commission and Multilateral Development Banks and bilateral donors.

b) Methods and approaches for assessing adaptation, adaptation co-benefits and resilience

Understanding how climate change affects agriculture is key to informing decision-making and enabling the implementation of adaptive measures. FAO supports countries in the identification of information sources, needs and gaps regarding adaptation co-benefits and resilience, including the following:

- *Statistics, research, analyses and tools* to ensure countries' compliance with the Enhanced Transparency Framework. These include advanced platforms for autonomous land monitoring from remotely-sensed data, SEPAL[2], OpenForis[3] and Collect Earth[4], EX-ACT[5], the Tracking Adaptation in Agricultural Sectors (TAAS)[6], Resilience Index Measurement and Analysis (RIMA)[7], the Adaptation Knowledge Tank[8], Guidelines on Addressing Agriculture, Forestry and Fisheries in National Adaptation Plans[9], Bioenergy and Food Security Approach[10] or the Agriculture Stress Index System[11], Self-evaluation and Holistic Assessment of climate Resilience of farmers and Pastoralists (SHARP)[12], and FAOSTAT[13] which offers statistics on livestock emissions, emission intensities in AFOLU sector and temperature change.
- *Strengthening coherent policy frameworks*, including through the Integrating Agriculture in National Adaptation Plans (NAPs-Ag) Programme [14], The Mitigation of Climate Change in Agriculture (MICCA) programme[15], the Forest and Landscape Restoration Mechanism[16], Blue Growth Initiative[17] and supporting UN Climate Resilience Initiative A2R[18].
- *Contributing to international processes and initiatives* including, the Technical Examination Processes on Adaptation and Mitigation, the Adaptation Committee, the Fiji Clearing House for Risk Transfer, the Least Developed Country Expert Group (LEG) and the Nairobi Work Programme (NWP).

Based on its experience, FAO suggests to continue working on:

- Ensuring that climate finance reflects the vital importance of agriculture e.g. by unlocking private sector investment providing access to innovation and technologies for adaptation, particularly in the least developed countries. A key element in this action should be policies, technologies, and facilitation to de-risk private sector investments and allow market-based instruments to sustainably scale up their engagement.
- Developing methodologies for assessing synergies and tradeoffs focusing on climate change adaptation, mitigation and resilience.
- Exploring synergies with the methods and approaches used for assessing costs and benefits of climate action, monitoring and evaluation, and reporting on the progress of adaptation and the Sustainable Development Goals (SDGs).

c) Improved soil carbon, soil health and soil fertility under grassland and cropland as well as integrated systems, including water management

Sustainable soil and water management play an essential role for agriculture, food security, ecosystem services, and climate change. Through its technical work, FAO is closing the knowledge gap by improving the understanding of the costs, benefits, trade-offs and synergies related to soil health and soil fertility and water management. FAO through the Global Soil Partnership[19] is supporting its Member Countries to sustainably manage soils and water, through the following activities:

- The *Global Soil Partnership (GSP)* provides a neutral platform for the scientific community and decision-makers to discuss and build scientific evidence on issues that can be translated into policies and actions.
- *Developing guidelines,* including voluntary guidelines for soil management[20], governance of tenure[21], safe use of wastewater in agriculture[22], and the Global Framework on Water Scarcity in Agriculture[23]. FAO is piloting and validating these in developing countries by addressing technical and institutional barriers, strengthening capacities on integrated agriculture systems, sustainable water management and reducing soil degradation.
- *Producing global data and information systems for evidence-based decision making*, such as the Global Soil Organic Carbon (SOC) Map[24] which enables countries to monitor SOC stocks, and AQUASTAT[25] - a global information system on water and its use for agriculture.
- *Organizing the annual Global Symposium*[26] to assemble scientific evidence and facts, identify knowledge gaps and defies challenges for implementation.

FAO proposes to capitalize on the expertise captured under the GSP and other instruments and jointly address following issues:

- Raising awareness of sustainable soil management and its co-benefits, including approaches to increase SOC sequestration and stocks and reducing SOC losses, particularly in carbon-rich soils.
- Developing guidelines, including on measuring, mapping, reporting and monitoring SOC stocks.
- Improving the knowledge and evidence base on the benefits of soil biodiversity and health, including through a global assessment of soil biodiversity.
- Supporting the initiative of the Commission on Genetic Resources for Food and Agriculture of FAO to develop a work plan on microbes and invertebrates, including those relevant for soil biodiversity and the sustained provision of soil-mediated ecosystem services essential for sustainable agriculture.
- Supporting the implementation of the actions of the Global Water Scarcity Initiative, as underpinned by an enhanced AQUASTAT.
- Implementing integrated systems in the agricultural sectors to improve soil health and soil fertility, as well as water availability and quality such as integrated crop-livestock, rice-fish, food-energy, integrated watershed management, and agroforestry systems.

d) Improved nutrient use and manure management towards sustainable and resilient agricultural systems

Improved and more efficient nutrient management in crop and livestock systems can support reduced GHG emissions as well as increased production and economic returns. Achieving this, requires a better understanding of some of the impacts, trade-offs and possible synergies that exist. FAO guidance and support in this area of work includes:

- *Global guidance and approaches,* including the Livestock Environmental Assessment and Performance (LEAP)[27] Partnership Guidelines for environmental quantification of nutrient flows and impact assessment in livestock supply chains[28], Code of Conduct for the Management of Fertilizers[29], Integrated Plant Nutrient Management[30], which aims to optimize physical, chemical, biological and hydrological soil properties to enhance productivity while reducing land degradation, and FAO Bioenergy and Food Security Approach which includes the assessment of biogas production[31].
- *Supporting international initiatives*, such as the Global Partnership on Nutrient Management[32], which aims to reduce the amount of excess nutrients in the global environment consistent with global development.

- *Providing and analysing relevant data* including up-to-date statistics on manure availability and usage[33].

FAO recommends that future discussions and work on improved nutrient use and manure management address the following:

- *Regulatory frameworks to facilitate integration*, in particular related to public health and the environment that consider sanitary and technical requirements to address nutrient leaching and pollution.
- *Recycling and recovery of nutrients and bioenergy* from animal waste (e.g. manure application to crops and biogas production); reduction of water nutrient pollution; re-using of nutrients for aquaculture.
- *Integrating native trees in the agriculture systems* and promoting agroforestry systems to naturally increase fertility of the soil and support more resilient systems.
- Improved and more efficient *planning and application of fertilizers* both spatially and in time.

e) Improved livestock management systems

Livestock is key to food and nutrition security and to building resilience to climate change. At the same time, livestock products are responsible for more GHG emissions than many other food sources. FAO provides support to countries to address the impacts of climate change on livestock production and to reduce GHG emissions from the sector. The relevant work areas include:

- *Information, methodologies and tools to assess the impact of climate change* on livestock and identify their role in building resilience. For example, an assessment tool[34] for the potential impact of climate change on breed distribution, Climate-Smart practices[35], and Global Early Warning System for Transboundary Animal Diseases[36].
- *Statistics, tools, methodologies and protocols for evidence based decision making*. This includes the Global Livestock Environmental Assessment Model (GLEAM)[37], the global database of emissions[38], the Smallholder dairy methodology for quantification of GHG emission reductions[39], as well as the report Tackling Climate Change through Livestock[40].
- *Piloting and validating technical and policy options* through programmes and projects, such as the Reducing Enteric Methane for improving food security and livelihoods[41] initiative.
- *Facilitating multi-stakeholder partnerships* and better integration of sustainability objectives, creation of synergies and mitigation of trade-offs, for example with The Global Agenda for Sustainable Livestock[42].

FAO recommends to apply integrated landscape management approach to improve livestock management systems in a climate smart way and therefore proposes to address the following four areas of work[a]:

- Productivity improvements that reduce emission intensities.
- Carbon sequestration through improved pasture management (see also element c).
- Better livestock integration in the circular bioeconomy (see also element d).
- Development and implementation of flock and herd health programmes to benefit rural and peri-urban communities, closing the efficiency gap in losses, waste, and disease prevention.

f) Socioeconomic and food security dimensions of climate change in the agricultural sector.

By 2030, UN member countries have committed themselves to eradicating extreme poverty (SDG1 - End Poverty) and hunger (SDG2 - Zero Hunger) for people everywhere and are at the heart of FAO's work. FAO is helping its Member Countries to develop and implement evidence-based policies, strategies and programmes that promote inclusive growth and sustainable livelihoods through the following activities:

- *Providing access to innovative practices, tools, technologies and knowledge* for rural poor, smallholder and family farmers, women, youth and indigenous communities to increase their productivity and income. Examples include the approaches of Greening the Economy with Agriculture[43] and sustainable food value chain

development[44], the Climate-Smart Agriculture Sourcebook[45] with a range of best practices and guidance, as well as the Modelling System for Agricultural Impacts of Climate Change (MOSAICC)[46].

- Supporting Member Countries in the *collection and analyses of socioeconomic trends* in the context of agriculture and climate change through a number of programmes and projects. These include the Economics and Policy Innovations for Climate Change (EPIC)[47] programme and the Analysis and Mapping of Impacts under Climate Change for Adaptation and Food Security (AMICAF)[48] project.
- *Supporting governments in the design of pro-poor policies, strategies and programmes*, such as the Nansen Programme[49] and the Great Green Wall Initiative for the Sahara and the Sahel[50], which promote inclusive and sustainable agriculture, income diversification, decent employment, access to social protection and people's empowerment in rural areas.
- *Providing socioeconomic analyses, guidelines and trainings*, including FAO Voluntary Guidelines to support the progressive realization of the right to adequate food in the context of national food security[51], evidence of the complex nexus between climate change, migration and agriculture and food security[52], and FAO annual flagship publications the State of Food and Agriculture, including the 2016 edition Climate Change, Agriculture and Food Security[53], the Save and Grow Initiative[54].

FAO therefore suggests addressing the following two issues for further work:

- Inclusive, nutrition-sensitive, risk informed and shock-responsive social protection systems with an aim to enable the resilience of rural livelihoods and reducing poverty;
- Policies and programmes that promote decent employment creation and entrepreneurship among the rural poor, family farmers, women, youth and indigenous communities, including by addressing the root causes of distress migration.

Conclusions

FAO takes a leading role in advocacy for food security and sustainable agriculture and offers support to countries in the following five key areas addressing climate actions for soil, livestock, nutrient and water management, assessment of adaptation, and socio economic food security dimension:

1) Compliance with enhanced transparency framework of the Paris Agreement and UNFCCC.
2) Coherent policy frameworks for climate action in the agriculture sectors.
3) Research, analysis and tools.
4) Knowledge sharing and Capacity Development for implementation and action in the agriculture sectors.
5) Scaling up Climate Investment for the agriculture sectors.

FAO stands ready and brings unique strengths to contribute to the effective development and implementation of the Koronivia Joint Work on Agriculture as evidenced in this submission. FAO, with a support from the World Bank and Oxford Climate Policy, has already organised an informal 'Koronivia dialogue', on 8-9 March in Rome, which enabled negotiators and countries to share their views and experiences on how to develop and implement this joint programme. FAO will continue to provide its support, and looks forward to working in partnership with other actors in the climate and development process to synergize the development and implementation of the Koronovia Joint Work on Agriculture towards 2020 and beyond.

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Annex 1: FAO contributions and submissions to SBSTA in-session workshops on issues relating to agriculture

Title of the Workshop	SBSTA meeting
The identification of adaptation measures, taking into account the diversity of the agricultural systems, indigenous knowledge systems and the differences in scale as well as possible co-benefits and sharing experiences in research and development and on the ground activities, including socioeconomic, environmental and gender aspects. **FAO submission**: http://unfccc.int/files/documentation/submissions_from_non-party_stakeholders/application/pdf/595.2.pdf	SBSTA 44, May 2016
The identification and assessment of agricultural practices and technologies to enhance productivity in a sustainable manner, food security and resilience, considering the differences in agro-ecological zones and farming systems, such as different grassland and cropland practices and systems **FAO submission**: http://unfccc.int/files/documentation/submissions_from_non-party_stakeholders/application/pdf/595.1.pdf **FAO intervention**: Overview of the concept of productivity http://unfccc.int/files/land_use_and_climate_change/agriculture/application/pdf/sbsta44_presentation_fao.pdf	SBSTA 44, May 2016
The development of early warning systems and contingency plans in relation to extreme weather events and its effects such as desertification, drought, floods, landslides, storm surge, soil erosion, and saline water intrusion **FAO submission**: http://unfccc.int/files/documentation/submissions_from_non-party_stakeholders/application/pdf/518.pdf	SBSTA 42, June 2015
The assessment of risk and vulnerability of agricultural systems to different climate change scenarios at regional, national and local levels, including but not limited to pests and diseases **FAO submission**: http://unfccc.int/files/documentation/submissions_from_non-party_stakeholders/application/pdf/519.pdf **FAO intervention**: Assessment of risk and vulnerability of agricultural systems http://unfccc.int/files/land_use_and_climate_change/agriculture/application/pdf/fao_vulnerabilityrisksbonn2015_v4.pdf	SBSTA 42, June 2015
The current state of scientific knowledge on how to enhance the adaptation of agriculture to climate change impacts while promoting rural development, sustainable development and productivity of agricultural systems and food security in all countries, particularly in developing countries, taking into account the diversity of the agricultural systems and the differences in scale as well as possible adaptation co-benefits **FAO submission:** http://unfccc.int/resource/docs/2013/smsn/un/135.pdf **FAO intervention**: Overview of climate change impacts on agriculture http://unfccc.int/files/meetings/warsaw_nov_2013/application/pdf/agriculture_workshop_12nov13_fao.pdf	SBSTA 39, November 2013