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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)
On Topics 2(e) and 2(f)

FAO welcomes the Koronivia roadmap (FCCC/SB/2018/L.1) and the opportunity to submit its views on the topics 2(e) – Improved livestock management systems, including agropastoral production systems and others and 2(f) – Socioeconomic and food security dimensions of climate change in the agricultural sectors.

KJWA recognizes the risks and vulnerabilities of agricultural sectors and food security[1] in a changing climate. In line with its mandate, FAO considers that adaptation, resilience and mitigation in agricultural sectors are essential to achieve its broader objective of eliminating hunger, safeguarding food security and nutrition, reducing rural poverty, and making the agricultural sectors more productive and sustainable. FAO is, therefore, committed to fight poverty, hunger and malnutrition, recognizing that inclusive, equitable, resilient and sustainable growth is key for achieving Sustainable Development Goals and moving people out of food insecurity and poverty. Furthermore, investing in low carbon, resilient and regenerative agriculture is essential to supply sufficient and quality food to meet the increasing needs of a growing population. In addition to addressing climate change, the international community is now faced with the new challenge of Coronavirus (COVID-19) pandemic that threatens peoples' lives and food security.

Given FAO's wealth of knowledge and technical expertise and considering that climate change cuts across all its areas of work, FAO is underlining the importance of the topics of 2(e) and 2(f) and propose some thematic areas to be considered for the in-session workshops as outlined in this submission.

2(e) - Improved livestock management systems, including agropastoral production systems and others

Livestock systems contribute to food security and livelihoods and support the resilience of hundreds of millions of people, amongst them some of the world's poorest. Livestock systems have changed in the last decades in terms of scale, shape and functions in response to a growing global demand for livestock products and increasing international trade. In many countries, small-scale mixed crop-livestock and pastoral systems co-exist with large-scale, resource-intensive and specialized systems, where feed and animal production are often spatially decoupled.

Livestock contributes to greenhouse gas (GHG) emissions with about 14.5% of global anthropogenic GHG emissions[2] in forms of methane (CH_4, 44%[3]), nitrous oxide (N_2O, 29%) and carbon dioxide (CO_2, 27%). The majority of emissions are associated with beef and dairy cattle systems (61%), whereas pig and chicken systems contribute only 17%. Enteric CH_4 fermentation from ruminants is a major source of emissions. CH_4 is a short-lived GHG that stays in the atmosphere for around 12 years; thus, mitigation options targeting CH_4 can provide faster climate benefits than longer-lived gasses such as CO_2 and N_2O.

Small-scale ruminant systems provide draft power and multiple socioeconomic benefits to millions of farming families together with ecosystem services. These systems, however, are vulnerable to the climate crisis and

[1] Food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life." From this definition, four main dimensions of food security are identified: food availability, food access, utilization and stability

[2] Gerber et al. 2013. Tackling climate change through livestock: a global assessment of emissions and mitigation opportunities. Rome: Food and Agriculture Organization of the United Nations. http://www.fao.org/3/a-i3437e.pdf

[3] These proportions are in global warming potential at 100 years (GWP_{100})

associated droughts and other extreme weather events, and growing disease pressure, while hundreds of millions rely on their animals to enhance their resilience. A changing climate can have devastating impacts on the health of animals. It can also affect disease patterns (e.g. the incidence, impact, spread and predictability of animal diseases) making outbreaks harder to control. Livelihoods that depend on animals are becoming less secure as a result.

Expansion of pasture for grazing cattle and feed crop into natural forests contribute to forest loss and GHG emissions from land-use change. Furthermore, livestock systems are diverse in terms of contexts, size, and functions. Such diversity requires system-specific solutions to reduce vulnerability and emissions.

What can be done to reduce emissions and vulnerability of livestock systems?

Productivity improvement can substantially reduce emission intensities, particularly where productivity is currently low.

- Improved livestock management through improved feeding, genetics, animal health, manure management, general husbandry and information technology can enhance productivity, making resource use more efficient with potential to reduce the overall environmental impact.
- Direct interventions that can mitigate GHG emissions, particularly from ruminants, include increasing forage quality, feeding legumes, directly-fed microbials, the use of feed additives, and supplementing with dietary lipids and concentrates.
- Targeted genomic selection programmes for cattle and sheep can reduce enteric CH_4 emissions and emission intensities.

Establishing early warning systems. EWS need to be established based on reliable information on climate, water and pasture and seasonal feed balances, especially in extensive grazing systems and in the drylands.

Access to climate finance. The enhancement and intensification of livestock systems can be costly, especially in small-scale and pastoral systems with limited access to inputs and markets. Climate finance directed at improving livestock systems, developing the value chains and enhancing bio-security can speed progress towards more resilient and productive livestock systems by supporting farmers through access to innovative technologies, market opportunities and infrastructure.

Improving land use. Restoring grasslands and rangelands through better grazing management and controlling the expansion of pasture and feed crop production into forests is one of the most effective ways to reduce GHG emissions associated with the livestock sector. Policies can also be directed to regulate land price and illegal land-use change.

Development of evidence-based policies. Context-specific policy measures can contribute to the reduction of GHG emissions in the livestock sector. These measures can include (i) carbon crediting scheme, (ii) subsidies to support farmers in boosting market competitiveness and risk mitigation schemes to protect the livelihoods of smaller and less efficient producers, (iii) incentives to adopt innovative technologies that enhance productivity and resource use efficiency, (iv) recoupling of livestock and crop production (e.g. through relocation grants), and (v) zero-deforestation policies to limit land expansion.

These are among several steps that can be taken to reduce GHG emissions from the livestock sector that have been identified by FAO[4].

How is FAO supporting countries?

- FAO provides tools, methodologies and protocols to assess GHG emissions. These include, for example, global and national assessments of livestock emissions using the Global Livestock Environmental Assessment Model (GLEAM) through which the impacts of technical and policy options to reduce GHG emissions can also be assessed; the guidelines produced by the multi-stakeholder Livestock Environmental Assessment and Performance (LEAP) partnership; the Self-evaluation and Holistic Assessment of climate Resilience of farmers

[4] FAO (2019) Five practical actions towards low-carbon livestock. Rome: Food and Agriculture Organization of the United Nations. http://www.fao.org/3/ca7089en/ca7089en.pdf

and Pastoralists (SHARP) tool; the Tool for Agroecology Performance Evaluation (TAPE); and the guidelines for establishing feed balances in pastoral systems.

- FAO builds capacity in countries for addressing climate change in the livestock sector, in particular for using tools and methodologies and in monitoring and evaluating the impact of practical solutions through projects and investments.
- FAO supports countries to identify, pilot and validate technical and policy options to reduce GHG emissions, in collaboration with the Climate and Clean Air Coalition (CCAC) and with Global Research Alliance on Agricultural Greenhouse Gasses (GRA).
- FAO is helping countries to access to Climate Finance, through the Global Environment Facility (GEF), the Green Climate Fund (GCF), the World Bank, the International Finance Corporation (IFC), the International Fund for Agricultural Development (IFAD) and other financial institutions.
- FAO works to improve prevention, preparedness, early detection and early response to animal health threats and emergencies that are triggered by climate change.
- FAO, in collaboration with strategic partners, including the World Organisation for Animal Health (OIE), World Health Organization (WHO) and International Atomic Energy Agency (IAEA), champions global and regional animal health programmes and strategies for the control of animal diseases, which reduce efficiency (thus increasing GHG emission intensities) and hamper adaptation to climate change.
- FAO facilitates the policy dialogue in support of sustainable livestock sector through the multi-stakeholder Global Agenda for Sustainable Livestock (GASL) and the proposed establishment of a livestock sub-committee of the Committee on Agriculture (COAG).
- FAO supports sustainable pastoralism through adaptation of policies, methodologies and tools to fit the specificities of mobile livestock system and by promoting a better understanding of its multi-functionality and the ways pastoralists manage variability.

Way forward

FAO will continue to support countries in developing sustainable and resilient livestock systems through strengthening the knowledge and evidence base, developing tools and piloting, validating technical and policy option and facilitating dialogue through intergovernmental and multi-stakeholder fora, resulting in better integration of livestock solutions in climate actions. FAO advocates for food security and sustainable agri-food systems and offers support to countries seeking to improve agri-food systems in the face of climate change. FAO will continue to support countries and looks forward to working in partnership with other actors in the climate and development fields to advance the implementation of the KJWA, coherently, towards COP26 and beyond.

2(f) - Socioeconomic and food security dimensions of climate change in the agricultural sectors

Agricultural sectors are particularly vulnerable to the impacts of climate change but are also a fundamental part of the solution to tackle climate change. Therefore, the sustainable transformation of agricultural sectors has a high potential to address many of the most pressing challenges of climate change impacts on the sector, especially on the small-scale farmers, who produce over 70% of the world's food needs. Agricultural sectors fulfil many livelihood functions, such as wellbeing, jobs and income for over 2.5 billion people, as well as food security for the global population. Yet, farmers are often constrained by limited access to resources, services, rights, technologies, markets and economic opportunities, which lower agricultural productivity, income, and affect the socioeconomic and food security dimensions.

For those reasons, regardless of any ongoing mitigation efforts, it is essential to transform the agricultural sectors to simultaneously reduce emissions, increase production and foster adaptation and resilience to climate change, in line with the Paris Agreement's preamble that recognizes the fundamental priority of safeguarding food security, ending hunger and poverty.

Addressing socioeconomic and food security dimensions in agricultural sectors

Recognizing the broad spectrum of socioeconomic and food security dimensions of climate change and agriculture, FAO is supporting countries through tailored solutions for normative and technical work to address the risks and impacts of climate change. Furthermore, FAO is identifying low carbon and resilient solutions to food production and agriculture. The FAO Strategy on Climate Change is grounded on principles relating to social inclusion and protection, the precedence of food security, poverty reduction, environmental and economic sustainability and results-oriented action to lower emissions and reduce climate risks with significant spill-over effects through the following actions:

Building an evidence-base for decision making. FAO collects, analyzes, processes and monitors data on climate change impacts and vulnerabilities in agricultural sectors to support countries in planning appropriate adaptation responses, reducing food insecurity and poverty, and where possible, reducing greenhouse gas emissions.

Strengthening sector policies. FAO supports state and non-state actors to develop and enhance a coherent set of economic, environmental, and social policies that holistically address climate change impacts in agricultural sectors, while ensuring integration into national climate change planning strategies.

Protecting livelihoods. Climate change disproportionately affects the most vulnerable countries and people, especially smallholder farmers, women, youth, local communities and indigenous people who are relatively more at risk of climate impacts. Therefore, FAO provides support to countries in developing shock-sensitive and responsive social protection systems that are also saving livelihoods and enhancing the capacity of households to respond, cope and withstand threats and climate change related crises.

Reducing food loss and waste (FLW)***.*** FAO works with a broad spectrum of stakeholders at macro, meso and micro levels to tackle FLW. This includes working with governments and international organisations towards advocacy, awareness raising and appropriate policies; facilitating coordination among food supply chain actors (farmers, handlers, processors and traders), changing consumers attitude, behavior and consumptions patterns related to food.

Transforming agricultural trade. FAO support global agricultural market integration towards the adaptive role of trade in terms of increasing availability of and access to food in the countries that will be negatively affected by climate change. More specifically, FAO supports countries to apply national measures and trade policies that promote productivity growth and ensure that the international trading system is open, fair and transparent, and assuring that these policies help agriculture and trade adapt to and mitigate climate change.

Building resilience. Guided by Resilience Strategic Programme, FAO conducts vulnerability and climate risk mapping, supports countries in the formulation of disaster risk reduction strategies in agriculture and food sectors, improving coordination mechanisms, monitoring and identifying risks and delivering early warning and early actions ahead of shocks, while strengthening the capacities of countries to prepare for and manage effective responses to disasters and crises affecting food security and nutrition.

Proposed areas to be addressed at the workshop

Agricultural sectors are essential to achieve global commitments, including 2030 Agenda for Sustainable Development, the UN Decade of Action on Nutrition 2016-2025 and the Paris Agreement. At the same time, there still is a need to identify and increase adoption of best practices which result in low carbon and more resilient food systems while addressing economic, social and environmental dimensions of sustainable development in a balanced and integrated manner. In order to support achieving these commitments, Parties may wish to address some of the following thematic areas during the in-session workshop on topic *2(f) – Socioeconomic and food security dimensions of climate change in the agricultural sectors* under the Koronivia roadmap:

Governance and coherent policy frameworks

- Putting in place the necessary financial, policy, technical means to mainstream climate change considerations into agricultural sectors while also addressing socioeconomic and food security dimensions;
- Ensuring institutional stability, transparency, accountability, the rule of law and non-discrimination, while leading towards more efficient decisions and underpinning access to food and higher living standards;
- Prioritizing adequate and coherent policies, plans and programmes, as well as climate finance to tackle food insecurity, and socioeconomic dimensions of agriculture and climate change;

- Involving women, youth, local communities and indigenous people representation in decision-making processes to address socioeconomic dimensions;
- Building resilience at local and national levels, through vulnerability and climate, socioeconomic and food security risk mapping; and
- Securing and protecting legitimate tenure rights in sustainable use of the environment and natural resources, social stability, and resilience as well as in achieving the overall national and global climate change goals.

Economic and production issues

- Creating decent on- and off-farm employment in agriculture and in the local nonfarm economy using greener practices, while strengthening/ developing local food systems, fostering entrepreneurship and public employment programmes, and increasing additional occupational skillsets of people;
- Improving climate-resilient infrastructure to strengthen food value chains, especially infrastructure for energy, transport, water and sanitation, and healthcare while using the most appropriate technologies;
- Reducing FLW along the entire food value chain, while improving efficiency of natural resource use;
- Enhancing private and public-sector support and investment to strengthen resilient and sustainable agriculture, enable access to technology development and transfer and provide access to economic, financial and other assets.

Social issues

- Enhancing equality for women, youth, local communities and indigenous people and ensure that underlying structural power relations and socioeconomic marginalization that lead to vulnerable groups around the world being more significantly affected by climate change;
- Combating gender-based violence, child, early and forced marriages that occur as a harmful coping strategy resulting from economic stress due to disasters and the slow-onset adverse effects of climate change with targeted measures;
- Developing and scaling-up of risk-informed and shock-responsive social protection systems that would help to protect vulnerable groups, their livelihoods, income and their food security; and
- Upscaling networks and connectedness of rural communities for knowledge exchange and strengthen social security, while enhancing participation in social, economic, environmental and climate policy formulation and implementation.

Climate and environment

- Reducing factors that are for worsening socioeconomic and food security dimensions, such as inadequate attention to sustainable agricultural practices and unsustainable natural resources management;
- Improving weather forecasting and early warning systems, including for disease outbreak such as coronavirus, to help farmers in planning agricultural practices and protect crops and livestock from adverse impacts of climate change;
- Improving capacities to manage disaster and climate risks while increasing adaptive capacities and resilience;
- Investing in nature-based solutions to protect, conserve and maintain ecosystem services for low carbon, local and resilient agriculture and food systems.

Climate change is already affecting global food security and the COVID-19 pandemic is affecting food systems and threatens to disrupt global food supply chains. Although the Coronavirus pandemic has caused cancellations and delays to major climate meetings and events, it is important to maintain momentum to step up climate action to achieve goals of the Paris Agreement. FAO looks forward to continuing to work with countries and other actors in the climate and development fields to bring KJWA from discussions to practical actions on the ground to help achieve the Paris Agreement goals while transforming agricultural and food systems. This includes addressing the additional challenges and impacts of the coronavirus pandemic on food security, especially for the most vulnerable countries and communities such as smallholder farmers.

Annex 1: A stocktake of FAO's work

Activity/ Initiative/ Publication	Brief description and how it is relative to Koronivia
The Global Livestock Environmental Assessment Model (GLEAM) *www.fao.org/gleam/en/*	GLEAM is a GIS framework that simulates the biophysical processes and activities along livestock supply chains using a life cycle assessment approach. GLEAM aims to quantify production and use of natural resources in the livestock sector and to identify environmental impacts of livestock to contribute to the assessment of mitigation scenarios, in the context of adaptation needs, to move towards a more sustainable livestock sector.
The Livestock Environmental Assessment and Performance (LEAP) partnership *www.fao.org/partnerships/leap/en/*	LEAP partnership is a multi-stakeholder initiative that is committed to improving the environmental performance of livestock supply chains, whilst ensuring their economic and social viability.
Global Agenda for Sustainable Livestock (GASL) *www.livestockdialogue.org/en/*	GASL is a partnership of livestock sector stakeholders committed to the sustainable development of the sector. The Agenda builds consensus on the path towards sustainability and catalyses coherent and collective practice change through dialogue, consultation and joint analysis.
Global Livestock Systems *www.fao.org/livestock-systems/en/*	A database of the global distributions of livestock systems for cattle, buffalo, sheep, goat, chicken, pigs, horses and ducks.
Pastoralist Knowledge Hub *www.fao.org/pastoralist-knowledge-hub/en/*	The Hub brings together pastoralists and international actors to ensure that pastoralists' concerns are integrated into the international policy dialogue. The Hub gives a voice to pastoralists and enables them to connect, to meet and to discuss issues and find shared solutions to common challenges.
Reducing enteric methane for improving food security and livelihoods *www.fao.org/in-action/enteric-methane/en/*	This project is a collaboration between FAO and the New Zealand Agricultural Greenhouse Gas Research Centre (NZAGRC) and is funded by the Climate and Clean Air Coalition (CCAC). It aims to support low- and middle-income countries to identify system-specific technologies and interventions aimed to increase livestock productivity, food security and reduce enteric methane emissions.
Global Information and Early Warning System (GIEWS)	As a response to the generalized food crisis of the early 1970s, the Committee on World Food Security prompted the creation of GIEWS. Over the years, GIEWS has established itself as the world's leading source of information related to early warning and as a respected authority on global food production, consumption and trade. It continuously monitors the food security situation in every country of the world and alerts the world to emerging food shortages.
African Sustainable Livestock 2050 (ASL2050) *www.fao.org/in-action/asl2050/en/*	ASL2050 pilots methodologies and builds country capacity to identify emerging challenges associated with the transformation of the livestock sector, as well as designng and implement policy instruments to address specific challenges on the ground.
Climate-Smart Livestock Management, Integrating Reversion of Land Degradation and Reduction of Desertification Risks in Vulnerable Provinces in Ecuador *www.fao.org/in-action/agronoticias/detail/en/c/1025398/*	Funded by the Global Environmental Facility (GEF), thes project aims to reduce land degradation, increase capacities to adapt to climate change and reduce GHG emissions, through the implementation of inter-sectoral policies and sustainable livestock techniques, with particular attention to vulnerable provinces.
Agrinvest Uganda	FAO is supporting the Ugandan Development Bank to boost responsible private sector investments in agriculture, which includes capacity building the estimation of GHG emissions from livestock with GLEAM-i.
Increasing carbon sequestration in Kyrgyzstan by supporting climate investments in forests and rangelands *www.greenclimate.fund/project/fp116*	FAO is implementing a USD 50 million Green climate Fund project aiming at achieving carbon sequestration in forests and rangelands and improving livestock productivity for reducing emissions, including through improving the national capacities in calculating GHG emissions
Projet de Développement de l'Élevage (PRODEL) in Cameroon *www.prodel.cm/*	FAO is providing technical assistance and capacity building on climate change to the large-scale World Bank investment project in livestock in the country, including on tools to monitor and evaluate the impact of the project on climate change.