APPROVED ENGAGEMENT STRATEGY FOR THE AGRICULTURE SECTOR

1. Objective

The agriculture sector Engagement Strategy has as objective to maximize the reductions of short-lived climate pollutants from the agricultural sector by 2030 by focusing on the most locally appropriate and technically feasible measures, with relatively low-cost financing and with substantive policy support, as identified by the CCAC Scientific Advisory Panel for the livestock, manure management, open burning and paddy rice sub-sectors; and position the agricultural sector to make a significant contribution to midcentury net-zero climate mitigation and sequestration strategies by identifying cross linkages with other climate forces, as for example, fertilizer use (N2O) and livestock keeping (CH4).

To fulfill the objectives of the Engagement Strategy, key foundations for action will be promoted to ensure the successful implementation of measures and strategies that are tailored to a country´s unique circumstances and needs, and are aligned with a broader set of food security, equity and sustainable development imperatives. These include the following:

- **Scoping the national context:** Because conditions vary widely across geographies, economies, and societies, a "one size-fits-all" approach should be avoided and key characteristics of a country's agriculture sector must be carefully considered. This includes an examination of national production and consumption trends of crops and livestock products, as well as the types and sizes of producers.
- **Involving stakeholders:** In addition to the relevant government ministries, the CCAC will encourage the involvement of other stakeholders such as farmers, indigenous peoples, and local communities at the national, subnational, and local levels so that diverse perspectives, needs, and priorities are incorporated. Small-scale agriculture producers, especially women and women's organizations, should be explicitly included, which requires targeted and sustained attention from policy-makers. Likewise, it is important to engage stakeholders that will be responsible for the implementation of agricultural climate action to maximize buy-in, including food processors and retailers that can encourage and drive the adoption of on-farm sustainability, while at the same time promoting an entire farm-to-fork production chain.
- **Establishing policy coherence.** Countries can consider progress made toward implementing existing goals and policies, and their coherence with other relevant plans, including other climate policies, as well as sustainable development policies by incorporating action on agricultural short-lived climate pollutants in national planning and policies.
- **Regional approaches.** Facilitating the sharing of best practices, peer-to-peer exchanges, technical know-how and options for supportive policy frameworks for reduction in agricultural short-lived climate pollutants.
- **Developing complementary global partnerships/initiatives**. Although various initiatives work on agriculture related initiatives, there is a risk of duplication and sub-optimal project size. By working together, the CCAC together with for example but not limited to, Global Methane Initiative (GMI), Global Research Alliance (GRA), Consultative Group on International Agriculture Research (CGIAR), World Bank, NDC Partnership Thematic Working Group (TWG), and Food and Agriculture Organization of the United Nations (FAO) will pool efforts to achieve economies of scale. Across these initiatives there is focus on research and innovation, policy and practice implementation, and provision of technical support and capacity building.

2. Goals

This strategy is focused on addressing methane and black carbon from the agriculture sector through an integrated approach to planning that tackles air quality and climate change by working across sub-sector and policy initiatives while contributing to multiple benefits for health, crop yields, food security and livelihoods. It drives towards action in line with the pathways presented in the IPCC 1.5 degree report, and the potential highlighted by the CCAC Global Methane Assessment (GMA) and Scientific Advisory Panel (20-25% methane reduction by 2030[i]; 35% reductions in black carbon by 2030, including from agriculture sources).

- **By 2030**, all CCAC partners collectively take action to ensure that agricultural short-lived climate pollutants are fully considered in national climate policy plans (such as, when relevant, Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPS), Long-Term Low Greenhouse Gas Emission Development Strategies), and that a sufficient number of countries have taken actions required to contribute to 20-25% methane reduction as highlighted in the GMA.
- **By 2030**, seek a national commitment with detailed implementation plans and buy-in at the subnational level by the top ten agricultural burning nations (Brazil, China, India, Indonesia, Mexico, Nigeria, Russian Federation, Tanzania, Thailand, US) to eliminate unnecessary agricultural burning.[ii]

Goal 1: Foster enabling frameworks

The CCAC can provide the greatest value by catalyzing action that encourages national governments to take action. This goal encompasses CCAC's sub-sector goals (goals 1.1-1.3), and specific activities and priorities identified under each".

This goal also supports the Strategic SLCP Planning Hub as a part of the 2030 Strategy to scale implementation measures to the national scale and support governments to overcome barriers to SLCP mitigation[iii]. This involves enhancing ambition in NDCs, exchanging knowledge and experiences of best practices and successful solutions across ministries and departments. To achieve this goal the CCAC will:

- Raise political awareness at the global, regional and national level about actions countries can take to reduce agricultural emissions by issuing policy briefs, developing strategic communications, and by convening high level dialogues[iv].
- At regional level, facilitate sharing of best practices and options for supportive policy frameworks for agricultural SLCP reductions that build on partner tools and resources.
- Identify and shill for the highest impact investments to remove critical barriers to clean, sustainable agricultural practices.
- Continue raising awareness amongst policy makers on the deleterious effect of air pollution on crop yields and overall productivity to stimulate greater air pollution control *and* the uptake of agricultural practices that can reduce impacts on crops.
- Linking policy makers with the appropriate existing user-friendly tools to calculate agricultural emissions, and the national costs and benefits of various interventions supported by open data principles to ensure transparency and equitable access to tools, which can underpin and garner support for SLCP mitigation actions.
- Enhance existing modelling analysis (IIASA-GAINS) on livestock mitigation potential with locally appropriate modelled outputs (i.e. FAO´s GLEAM Model)

Goal 1.1: Advance sustainable manure management at large and small feedstock operations

Manure is a valuable source of nutrients, organic matter and renewable energy. Manure is key to enhancing soil fertility as base for food security, climate adaptation and carbon sequestration. However, manure management is often poor and as a consequence nutrients and organic matter are lost, causing environmental and climate problems and threatening public health.

To achieve this goal the CCAC will:

- Articulate a vision for clean, healthful manure management in small and large scale operations, including strategies to address full lifecycle impacts building on the CCAC supported opportunities for practice change on integrated manure management implemented across 7 countries[v].
- Upon request, continue assisting nations with technical and policy work to address manure management at large and smaller farming operations per the strategies identified in CCAC-supported 2014 Global Assessment report[vi] and building on CCAC supported projects for promoting strategies for methane mitigation from manure management in national planning and policy processes[vii].

Goal 1.2: Eliminate agricultural burning

Open burning in agriculture – defined as all intentional burning in the agriculture and forestry sector, including stubble and pasture and burning and use of fire to clear fallow lands, but excluding prescribed burns on wildlands – is a practice with deep historical roots. Farmers burn for a variety of reasons, and rarely simply as a tradition. The practice for example occurs to cheaply remove excess straw that might otherwise snare or break ploughs; to remove insect pests and weeds; or to "fertilize" the soil with ash (a common misconception due to the black appearance of charred earth). Responsible for more than a third of all black carbon emissions, open burning is the single largest source of black carbon, a short-lived climate pollutant that contributes to air pollution, climate change, and increased melting in the cryosphere (regions of snow and ice) where knock-on effects for water supply[viii] could devastate billions of lives. Open burning also represents one of the largest causes of air pollution-related illnesses and deaths after cookstoves.

In many parts of the world, harvest season coincides with peak air pollution as farmers burn off crop residues to prepare for replanting. The methane and nitrous oxide released during open burns negatively impacts the climate as well (though black carbon emissions are thought to be mostly offset by an equivalent amount of cooling particles).

To achieve this goal the CCAC will:

- Identify and prepare fact sheets on proven crop residue management strategies for the most-frequently burned crops (maize, rice, wheat and sugar cane).
- Explore alternative uses of crop residues with strong business cases for self-sustaining operations once the feasibility of such uses is/are demonstrated.
- Track and issue periodic reports on observed open burning trends per publicly available satellite images, especially in the 10 largest agricultural burning nations.
- Create policy briefs with health, financial and other cost/benefit for reducing/eliminating burning.

Goal 1.3: Reduce rice paddy flooding

Paddy rice is a staple crop for much of the world's population. It is also a key source of the greenhouse gas methane, responsible for about 8 per cent of total global methane emissions[ix]. Several sustainable rice production practices can reduce emissions, including reducing water use, and improving fertilizer efficiency through site-specific nutrient management. Integrating low-emission technologies and practices throughout the entire value chain can control increasing methane emissions and ensure the livelihoods of millions of smallholder rice farmers.

This goal seeks to promote the conversion of continuously flooded fields to intermittent flooding (also known as Alternate Wetting & Drying or AWD) and explore the next, potentially revolutionary frontiers, such as low-emission varieties and dry rice cultivation.

To achieve this goal the CCAC will:

- Update the CCAC supported rice paddy information kiosk and recommendations to reflect the trade-offs on nitrous oxide and methane formation under traditional intermittent flooding practices.
- Raise awareness on and, as appropriate, promote low-emission farming practices under bundled technology suites such as the System of Rice Intensification (SRI) [x] and the Sustainable Rice Platform (SRP)[xi] standard innovated for small rice farming operations.
- In collaboration especially with partners, facilitate implementation of best low-emission practices suited to focus countries.
- Identify collaborative opportunities to provide country assistance to facilitate the inclusion of rice emission targets in their updated NDCs after 2025.

Goal 2: Forge cross-linkages to net-zero climate mitigation strategies

Achieving the long term goals set in the Paris Agreement requires both achieving "net-zero by 2050" for emissions of long-lived gases and large reductions in emissions of short-lived climate pollutants.
There may be opportunities to work collaboratively on agricultural projects with short-term and long-term climate features.

To achieve this goal the CCAC will:

- Evaluate the potential for "piggy-backing" SLCP measures onto active policy initiatives related to bioenergy or renewable energy projects, agricultural energy consumption, cold chain development / expansion, digitization, soil health and fertility as well as soil carbon sequestration, water management, nutrient cycles management and circular agriculture/economy, farm insurance schemes, farm waste management, food waste management and more broadly any action beyond the farm gates involving the food supplies chains, including consumers, and/or weather/adaptation services.
- Develop concrete proposals for collaborative engagement on the most promising options.

Goal 3: Advance Market Readiness of Products to Reduce Enteric Methane and Promote Emissions Intensity Reductions

7 billion people worldwide depend on livestock systems, which provide 33 percent of the protein consumed in human diets and account for 40 percent of global agricultural gross domestic product (GDP).[xii]

Enteric methane emissions from ruminant animals raised for their meat and milk account for as much as 30 per cent of global anthropogenic methane emissions[xiii].

The CCAC will raise awareness on innovative low-cost or no-cost solutions for reducing emissions intensity per unit of product, and for animal health and wellbeing, livestock management and feed including feed additives to reduce enteric fermentation in ruminants, taking the larger crop-food-waste cycle into account to avoid any negative unintended consequences.

To achieve this goal the CCAC will:

- Prepare and distribute an updated landscape assessment of the current state of play targeting national governments.
- Convene a technical expert group with the involvement of SAP members to analyse innovative technologies, such as methane inhibitors (e.g. feed additives, seaweed), for novel enteric methane potential.[1]
- Communicate the results of demonstration projects implemented by FAO and other partners and raise awareness on and, as appropriate, seek uptake of policy recommendations into national and regional policy and planning processes.

[1] This group could also discuss the need to understand the dynamics between societal equity, agriculture, and emission reduction efforts.

ANNEX 1 - CONTEXT

Climate change and air pollution increasingly threaten food production and supply, making the challenge of ending hunger and malnutrition more difficult than ever. This situation is further aggravated by the COVID-19 pandemic that has inflicted severe economic damage at all scales, from the local to the global economy.

With food demand projected to sharply increase by 2050, action is needed to prevent the worst impacts of climate change and air pollution on food security and allow time for agricultural production systems to adapt.

Reducing agricultural emissions of short-lived climate pollutants, like methane and black carbon, is vital if the world is to keep warming to 1.5° C by the end of the century. Agriculture, forestry and other land use are estimated to be responsible for about 23 percent of all greenhouse gases emitted worldwide[xiv], including roughly 40 percent of global black carbon emissions and half of all human-made methane emissions.

There is a clear need to balance emissions reductions with agricultural productivity and food security as close to 800 million people – or 78 percent of the world's poorest and most food insecure people – live in rural areas in developing countries, where they rely on agriculture for their livelihoods[xv]. Smallholder and women farmers, in particular, often lack voice and power within global agricultural value chains, meaning the implementation of measures to reduce short-lived climate pollutant emissions from agricultural production must consider these broader inequalities, as well as be a priority for country governments and agricultural businesses.

In addition, short-lived climate pollutant reduction measures for agricultural production must be coupled with efforts, comprising multiple partnerships across public and private entities, to tackle cross linkages within the broader sustainable food systems approach that are required to address climate change, eliminate hunger and malnutrition, halt biodiversity loss and resource depletion, protect the ecosystem services on which agriculture depends and tackle the many other challenges identified in the UN Sustainable Development Goals (SDGs)[xvi].

Safeguarding food security, ending hunger and the particular vulnerabilities of food production systems are recognized as fundamental priorities in the response to climate change[xvii]. The goals of the Paris Agreement cannot be met without transformative changes in the agriculture sector.

The Climate and Clean Air Coalition´s (CCAC) Engagement Strategy for Agriculture within the 2030 Strategy builds on the CCAC´s Agriculture work to date, which aims to support actions that reduce short-lived climate pollutants from the sector - minimizing methane and reducing black carbon from the sector- in a manner that delivers quick benefits for the climate and air quality, while enhancing food security.

Existing measures to reduce methane emissions in the agricultural sector can achieve ~30 Mt/yr by 2030, and measures exist mainly in paddy rice cultivation (6-9 Mt/yr), livestock emissions from enteric fermentation (4-42 Mt/yr), and behavioral changes (65-80 Mt/yr). The CCAC has been demonstrating solutions to reduce short-lived climate pollutants from the sector that deliver quick benefits for the climate and air quality. All solutions are based on existing technology and can be carried out at no or low cost. CCAC has supported projects in livestock and manure management, rice paddy management, open burning, agriculture waste-to-energy, and raising agricultural climate ambition in country´s Nationally Determined Contributions (NDCs).

The following Engagement Strategy sets out to describe the Coalition's desired outcomes and milestones and goals for the agriculture sector that build off the CCAC´s accomplishments to date and contribute to the 2030 Strategic key directions on: (1) Driving and Ambitious Agenda; (2) Supporting National and

Transformative Action; and (3) Advancing Policy- Relevant Research and Analysis. These are intersecting as all CCAC work should ideally incorporate elements for each of the three (new or building on past CCAC/related).

CCAC State and non-State Partners will engage in this work through a dedicated Hub (see Annex 1). They will develop activities, identify funding opportunities, foster peer-to-peer-engagement and exchange of best practices for SLCP mitigation planning and policy for the sector, and will coordinate closely with the SLCP Strategic Planning Hub.

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[i] These are the targets adopted in 2019 by the CCAC Mineral Methane Initiative and Global Methane Alliance, which also promotes intensity.
[ii] Following the recommendations of the CCAC supported Global Transition Plan. International Cryosphere Climate Initiative (ICCI) (2020) Addressing Open Agricultural Sector Burning: A CCAC Global Transition Plan. Available here: https://www.ccacoalition.org/en/resources/addressing-open-agricultural-sector-burning-ccac-global-transition-plan
[iii] As per the 2030 Strategy (p.4) Sectoral Hubs will advise governments on ways to define and implement mitigation measures based on sector-specific requests identified through the 'Strategic SLCP Planning Hub.' They will identify and share key mitigation measures and strategies for implementation at scale, and opportunities for transformative change in their sectors.
[iv] There is an immediate opportunity for CCAC to raise political awareness by engaging in Member State led Summit Dialogues, Global Summit Dialogues and Independent Summit Dialogues in the lead up to the Food Systems Summit as part of the Decade of Action to achieve the Sustainable Development Goals (SDGs) by 2030. The Summit will launch bold new actions to deliver progress on all 17 SDGs, each of which relies to some degree on healthier, more sustainable and equitable food systems. Read more here: https://www.un.org/en/food-systems-summit/about
[v] CCAC (2020) Livestock and Manure Management (CCAC website): Impacts and Results. Available here: https://www.ccacoalition.org/en/activity/livestock-and-manure-management
[vi] Wageningen University. (2014) Global Assessment of Manure Management Policies and Practices. Available online: https://www.ccacoalition.org/en/resources/global-assessment-manure-management-policies-and-practices
[vii] CCAC (2019) Promoting methane mitigation from manure management in China. Available online: https://www.ccacoalition.org/en/activity/promoting-methane-mitigation-manure-management-china
[viii] Prakash. A. and Molden, D. (2020) Mapping challenges for adaptive water management in Himalayan towns. Water Policy Journal. Available online: https://iwaponline.com/wp/article/22/S1/1/72146/Editorial-Mapping-challenges-for-adaptive-water
[ix]Global Methane Assessment emission estimates for rice cultivation are based on 5 different modeling groups (CEDS; EDGAR; FAO; GAINS; USEPA), which between them show average 2017 emissions from rice cultivation to be 30.6 Mt. This compared to average global anthropogenic methane emissions (excluding biomass burning) of 360.6 Mt in 2017 shows that rice cultivation contributes to 8.% of total anthropogenic emissions.
[x] SRI International Network and Resources Center http://sri.ciifad.cornell.edu/index.html
[xi] Sustainable Rice Platform http://www.sustainablerice.org/Resources/#srp-standard
[xii] United Nations Framework Convention on Climate Change (UNFCCC) (2021) Improved livestock management systems, including agropastoral production systems and others. Available online: https://unfccc.int/sites/default/files/resource/sb2021_01_adv.pdf
[xiii] Food and Agriculture Organization (FAO) and New Zealand (2016). Reducing Enteric Methane for Improving Food Security and Livelihoods. Available here: https://www.ccacoalition.org/en/resources/reducing-enteric-methane-improving-food-security-and-livelihoods
[xiv] Emissions are estimated for the period of 2007-2016. See IPCC - Climate change and Land (2019)
[xv] World Bank (2013) Implementing agriculture for development: World Bank Agriculture Action Plan (2013-2015) Available online: Implementing agriculture for development : World Bank Group agriculture action plan (2013-2015)
[xvi] International Panel of Experts on Sustainable Food Systems (IPES) (2019)Towards a Common Food Policy for the European Union.
[xvii] Paris Agreement text English (unfccc.int)