CCAC
CLIMATE AND CLEAN AIR COALITION
TO REDUCE SHORT-LIVED CLIMATE POLLUTANTS

CCAC INITIATIVE

ADDRESSING SLCPS FROM AGRICULTURE

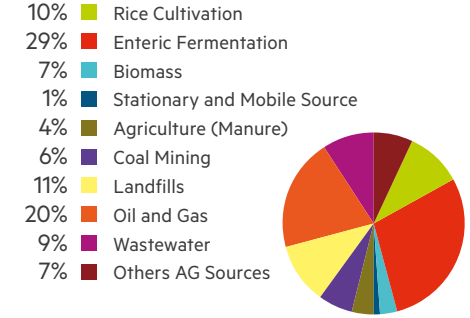
SHORT-LIVED CLIMATE POLLUTANTS AND AGRICULTURE: THE CHALLENGE

Agriculture and related land use practices, are a major source of short-lived climate pollutant (SLCP) emissions, constituting approximately 11% of all greenhouse gas emissions globally. The agriculture and forestry sectors are responsible for roughly 40% of global black carbon emissions and approximately 50% of global anthropogenic methane emissions.

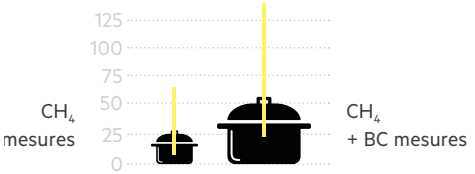
It is projected that agriculture production will be increasingly impacted by climate change, with altered rainfall patterns and extreme weather events causing agricultural productivity losses. In addition, black carbon and increased tropospheric ozone caused by several man-made gases, including methane, also negatively impact crop production.

Reducing emissions of SLCPs can therefore limit damages to agricultural productivity, particularly on South and East Asian crops where emission levels are often highest. It has been estimated that bold action to reduce SLCP emissions globally, has the potential to avoid 30-50 million tons of staple crop losses – corn, rice, soy, and wheat - annually by 2030. The annual economic gains for all four crops in all regions ranges between US$4billion and US$33 billion, of which US$2–28 billion would accrue in Asia. These measures could also avoid nearly 0.5˚C warming by 2050 and 2 million premature deaths annually by 2030.

ESTIMATED GLOBAL ANTHROPOGENIC METHANE EMISSION BY SOURCE, 2010



FOOD SECURITY



Annualy avoided crop yield fosses
(total maize, rice, soybean and wheat, million tonnes)

The main sources of global anthropogenic methane emissions include enteric fermentation in ruminant species (~29%), rice cultivation (~10%), and decomposition of manure under anaerobic and warm conditions (~4%). Agricultural fields (~4%), forests (~16%), and grasses and woodlands (~20%) are responsible for approximately 40%, or 3.0 million tons, of global black carbon emissions of 7.6 million metric tons per year.

WHAT IS THE INITIATIVE DOING?

The CCAC Agriculture Initiative is the first action-oriented global effort to address SLCPs - methane and black carbon - emissions from key agricultural sectors **by sharing and implementing best practices in a manner that enhances food security and livelihoods and is consistent with broader climate change objectives.**
With support from environment, agriculture and development stakeholders, the Initiative focuses on identifying and facilitating the implementation of best management practices and technologies tailored to national and local circumstances, including needs assessments and studies to identify opportunities, development of knowledge products to raise awareness, training & capacity building, and working with farmers, policymakers, and other stakeholders to overcome barriers to implementation.

The **CCAC Agriculture Initiative consists of three 'components',** with a fourth under development:

— livestock & manure management
— open agricultural burning
— paddy rice cultivation
— enteric fermentation (under development)

The Agriculture Initiative is led by nine lead partners: Bangladesh, Canada, the European Commission, Ghana, Japan, Nigeria, the United States, the Food and Agriculture Organization of the U.N. (FAO), and the World Bank.

LIVESTOCK & MANURE MANAGEMENT COMPONENT

As of 2010, roughly 31% of the total annual global methane emissions originate from livestock; roughly 10% of livestock emissions are from manure. While global emissions from livestock and manure are growing, near-term low-cost reduction opportunities in the livestock sector are abundant, representing roughly one-third of global methane emissions from manure. The work proposed under the Initiative has the potential to significantly contribute to these reductions if scaled out and implemented as envisioned.

Measures for direct reduction and capture of methane emissions from manure management are proven in the field and readily adopted, enabling to reduce up to 40–50% of the current emissions.

The objective of the Livestock and Manure Manage-ment component is to integrate manure management practices into livestock systems and improve existing practices to reduce SLCPs and other harmful emissions to the environment, capture methane as an energy source, and optimize nutrient utilization for crop production by managing and removing barriers to action with a view toward enhancing food security and sustainable development.

In pursuit of these objectives, the Livestock & Manure Management is establishing a Central Hub at Wageningen University and three Regional Centers, including the International Livestock Research Institute (ILRI) in Africa, the Tropical Agricultural Research and Higher Education Center (CATIE) in Latin America and the Stockholm Environment Institute (SEI) in Asia where these implementing partners, in collaboration with with local farmers, national authorities, and other key stakeholders, are developing opportunities for practice change to promote integrated manure management that will be implemented in 2015. The Central Hub and Regional Centers will study local conditions, glean knowledge from and partner with local and regional agricultural producers and experts, and provide necessary expertise, information and access to resources to facilitate policy and local-level practice change. In addition, the Central Hub and Regional Centers are creating an on-line knowledge hub – the Manure Management Kiosk - to provide easy remote access on best practices about manure management.

MITIGATION & CO-BENEFITS OF INTEGRATED MANURE MANAGEMENT

Integrated manure management deals with the whole process chain of manure: from excretion up to its final application to fields or for other use. Capturing methane from manure for use as a heating or cooking source can save the use of fossil fuels, firewood or dung cakes. Replacing solid fuels with methane also reduces emissions of black carbon addresses large negative effects on public health, especially for women and children. Another important co-benefit of better manure management is the improved soil quality and fertility, leading to increased production of food and feed and thus contributing to improved food security and livelihoods. Good manure management also reduces the need for phosphorus and synthetic nitrogen fertilizer, the latter produced at the expense of large amounts of fossil energy.

THE PADDY RICE PRODUCTION COMPONENT

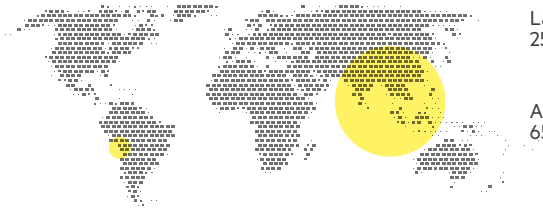
Rice is a staple crop in more than 100 countries. Asia contributes 90% (650 million tons) of the global supply, followed by Latin America (25 million tons). While rice production contributes greatly to securing the world's food, it exacerbates climate change because it emits methane, a potent greenhouse gas (GHG). Methane is produced by anaerobic bacteria in the soil when rice fields are flooded. Although estimates vary and have high uncertainty, flooded rice fields contribute about 20–30 Mt CH4/ year, or 10% of total GHG emission from agriculture globally.

The Paddy Rice Production component is led collectively by the International Rice Research Institute (IRRI), the International Center for Tropical Agriculture (CIAT), and the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). The effort aims to disseminate alternate wetting and drying (AWD) on large scale to facilitate both more stable food supply and reduction in methane emissions.

AWD technology involves the practice of periodically drying rice fields and re-flooding these at optimum water level. Long years of research have shown that AWD could reduce methane emissions by 30–50%. It also presents other benefits, such as reduced water use and production cost and improved rice yields.

The main activities of the current workplan for 2014 to 2016 include identifying priority areas where AWD can be implemented and establishing national round-tables to pinpoint incentives, technical support mechanisms and enabling conditions to overcome barriers that farmers face using the new practices. A global information platform will be set up to offer a database for country-and region-specific information and best practices related to AWD.

The CCAC Agriculture Initiative is partnering with three priority countries for 2014 to 2016 on national AWD strategies: Bangladesh, Colombia and Vietnam.



Latin America
25 millions tons

Asia 90%
650 millions tons

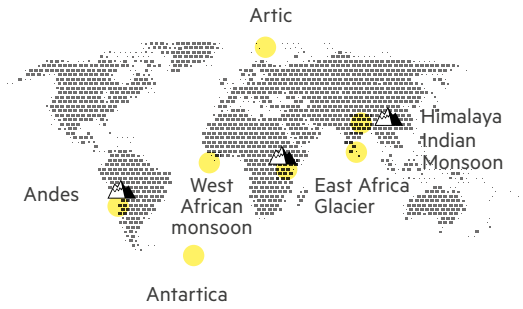
THE OPEN BURNING COMPONENT

Climate change is happening faster and in a dramatically more visible way in the Earth's "cryosphere" – regions of ice and snow - than anywhere else on earth. The Himalayas store more freshwater ice and snow than any region outside the poles: nearly 10% of the global total, and impacting up to 40% of the world's population. The Andean cryosphere, while not large to begin with, provides freshwater to millions in the major urban centers of the Andean nations, these high tropical glaciers are disappearing more rapidly than any others.

The International Climate Cryosphere Initiative (ICCI) is leading this component that seeks to develop replicable and scalable open burning mitigation options in the Eastern Himalayas and Andes regions in 2014-2015, two cryosphere regions particularly sensitive to emissions of black carbon, which accelerate melting of ice and snow. Upon the completion of this initial phase of work, these efforts will present an opportunity to identify near-term actions within these two regions that can be implemented to reduce black carbon emissions in addition to addressing open agricultural burning practices in additional regions around the world. Shovel-ready pilot projects will also be designed for each region with the potential for being scaled out, in order to catalyze reductions in the estimated 40% of black carbon emissions globally arising from this source, and for which a 50% global reduction could result in 190,000 avoided deaths annually on the global scale.

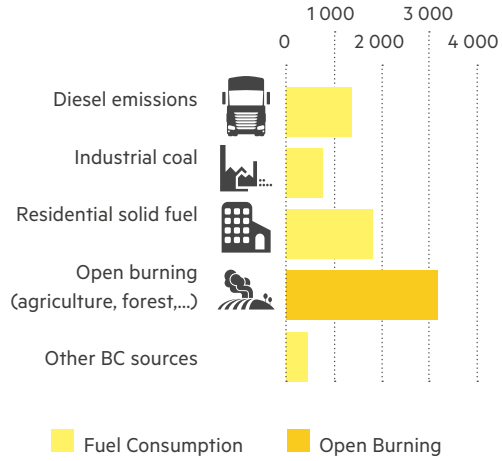
The objective of the Open Agriculture Burning component is to replicate and scale up open burning mitigation options as the final outcome of a step-wise process of:

- determining the nature of open burning (who burns what, when, where and why) in the target regions of the Eastern Himalayas and Andes,
- creation of regional open burning networks and partners through the tool of convening two regional conferences, one in each region that will feed into project goals and outcomes through information sharing,
- the development of shovel-ready pilot mitigation projects with specific actions targeted to each region and crop type.



Benefits of SLCP control measures, particularly black carbon: reduced melting in cryosphere regions.

GLOBAL BLACK CARBON EMISSIONS BY SOURCE TYPE IN KILOTONS/YEAR



HIGHLIGHTS: CHANGE IN AGRICULTURE PRODUCTION PRACTICES SET IN MOTION

The Agriculture Initiative is working with key networks of actors with the capacity to disseminate best management practices and ensure their implementation over time on the ground, including national and sub-national organizations, farmer organizations and extension services, and is planning to engage with the private sector. Key actions include:

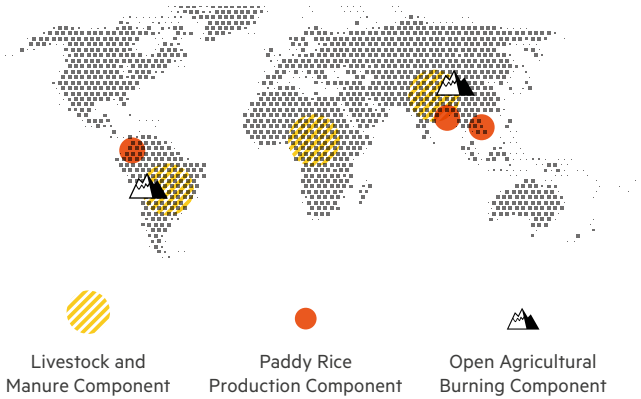
- The Livestock Manure Management Component has developed a manure management framework to systematize worldwide information collection on this sector; is finalizing a global scoping study on manure management practices; and has prepared a set of opportunities for practice change for dedicated allocation of resources in 2015.
- The Paddy Rice Component has targeted Vietnam, Bangladesh and Colombia as priority partner countries from the Southeast Asia, South Asia, and Latin America regions to develop initiatives for up-scaling alternate wetting and drying (AWD) practices at the national level. Government officials in these countries are collaborating with the CCAC to prepare country implementation plans.
- The Open Burning Component has completed a mapping exercise to characterize burning in the Andes and Himalayas regions so that mitigation efforts can be appropriately targeted.

LOCATION OF ACTIVITIES

Livestock and Manure Component: Latin America, Africa, and Asia regional activities (country-specific activities to be determined); global knowledge platform

Paddy Rice Production Component: Vietnam, Bangladesh and Colombia (Phase 1)

Open Agricultural Burning Component: Eastern Himalayas (Central, South, and East Asia) and Andes regions (Western South America, Patagonia)



Livestock and Manure Component

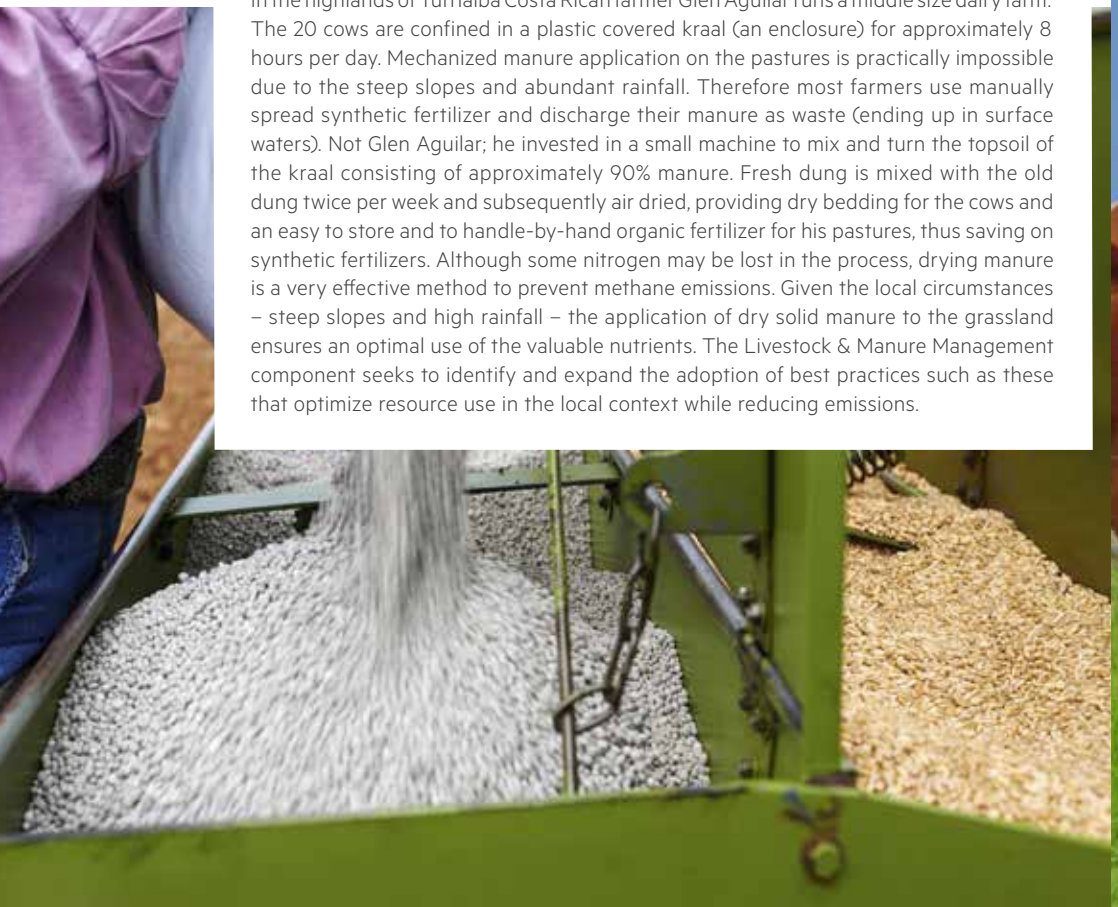
Paddy Rice Production Component

Open Agricultural Burning Component

INSIGHT STORY

No wasted manure

In the highlands of Turrialba Costa Rican farmer Glen Aguilar runs a middle size dairy farm. The 20 cows are confined in a plastic covered kraal (an enclosure) for approximately 8 hours per day. Mechanized manure application on the pastures is practically impossible due to the steep slopes and abundant rainfall. Therefore most farmers use manually spread synthetic fertilizer and discharge their manure as waste (ending up in surface waters). Not Glen Aguilar; he invested in a small machine to mix and turn the topsoil of the kraal consisting of approximately 90% manure. Fresh dung is mixed with the old dung twice per week and subsequently air dried, providing dry bedding for the cows and an easy to store and to handle-by-hand organic fertilizer for his pastures, thus saving on synthetic fertilizers. Although some nitrogen may be lost in the process, drying manure is a very effective method to prevent methane emissions. Given the local circumstances – steep slopes and high rainfall – the application of dry solid manure to the grassland ensures an optimal use of the valuable nutrients. The Livestock & Manure Management component seeks to identify and expand the adoption of best practices such as these that optimize resource use in the local context while reducing emissions.



CALL TO ACTION & APPEAL FOR PARTICIPATION

Expressions of interest in participating in the CCAC Agriculture Initiative should be directed to the CCAC Secretariat. In particular, we seek to collaborate with: global experts in livestock, manure management and enteric fermentation; livestock stakeholders in tropical regions involved in local and national initiatives; paddy rice production stakeholders in South and East Asia and Latin America; and agricultural crop production stakeholders in the Andes and Himalayas regions.

ABOUT THE CCAC

The Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants (CCAC) is a voluntary global partnership of governments, intergovernmental organizations, business, scientific institutions and civil society committed to catalysing concrete, substantial action to reduce SLCPs (including methane, black carbon and many hydrofluorocarbons). The Coalition works through collaborative initiatives to raise awareness, mobilize resources and lead transformative actions in key emitting sectors.

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