

Incentives to implement Climate Smart Agriculture

At COP21, 194 countries declared they want to keep the global temperature rise below 2 degrees Celsius on top of pre-industrial levels, with the ambition to limit the rise to 1.5 degrees Celsius. If we want to achieve this, agriculture needs to step up and do its part. Agriculture, forestry and other land uses (AFOLU) are responsible for 24% of global greenhouse gas (GHG) emissions, and agriculture accounts for 50% of AFOLU emissions. Agriculture contributes to climate change in the following matters: loss of organic matter in soil, emissions from the livestock sector, food losses and waste, non-sustainable production methods and abuse of peat soils by agriculture. Agriculture is, at the same time, a victim of climate change and encounters many problems due to it, thus a greater resilience of food systems and farming livelihoods is necessary. Simultaneously, agricultural production needs to increase to ensure global food security. Climate change, in turn, also has a threatening impact on agricultural production, endangering global food security and sustainability. This vicious cycle needs to break.

The focus of this brief is Climate Smart Agriculture (CSA). The agriculture and food sector faces three challenges regarding long-term sustainability of farming practices: (1) reducing the impact on the climate, by seek opportunities to mitigate emissions of greenhouse gases and increase carbon sequestration, (2) adapting to climate change, by enhance people's resilience and increase the capacity of agricultural and food systems to adapt to climate change, and (3) achieving food security now and in the future, by sustainably increase agricultural productivity and incomes to meet food security and development goals.

In the remainder of this policy brief we will offer concrete tools to realize this triple-win of CSA, which are attractive solutions offering hands-on options applicable in most contexts. We will discuss all the relevant stakeholders that will be impacted by policy changes, the four problems we focus on, the solutions for these problems, the target groups for the solutions and the policy incentives to motivate the stakeholders to implement the CSA solutions. The problems/incentives are as follows:

- GHG emissions/Promote behaviour change of farmers
- Food waste/Taxing waste-flow processors and retailers
- Water scarcity/Financial incentives on high-tech Greenhouses
- Lack of capacity/ Invest 0.5% of GDP on capacity building to develop CSA

Stakeholders

There is growing pressure on businesses and governments to pay more attention to the environmental and resource consequences of the ever-increasing production, distribution and consumption of agro products. Serious concerns have been expressed about the sustainability of agri-food supply chains with the current population and consumption trends, but also on the climate impact of the supply chain as it is functioning now. Concerning the development of incentives for a policy on CSA, the focus should be on stakeholders in the food supply chains that have power and influence.

- In the production phase, both big farming businesses as well as small (associated) farmers are of major importance; they are executing the current production process, and changing their production mode with Climate Smart agriculture solutions.
- Following the supply chain, traders and agro logistic actors ensure that the products of the farmers reach processors, retailers and consumers.
- Service providers provide services to the producers or traders, such as mechanical equipment.
- Insurance, investors and banks can be impacted also by a changing policy on CSA;
- Agro-Logistic and transportation are influenced by policy on CSA to the degree of the type of measures taken concerning CSA.
- Processing and retail, which often takes place within big companies, can have a major influence on the feasibility of CSA, because the big companies that are responsible here, often have much power over other parts of the supply chain as well.
- Citizens or consumers could have a major impact on CSA if people unite and strive towards that common goal.

POLICY BRIEF

- Governments are essential for the provision of a supporting institutional environment, which should have a facilitative and reinforcing impact on multiple phases of the chain.
- Academia and education institutions, can also be of influence in their research for new good options for CSA.
- Farmer NGO's could also contribute to improve the situation of farmers.

Problem GHG emissions

Solution Capture carbon in the soil

Key Stakeholders Accountable Farmers

Policy Incentive Promote behaviour changes of farmers

Greenhouse gas emissions have spiked and global temperatures have risen dramatically in recent decades. Agriculture is estimated to contribute directly about 10%-12% of total GHG emissions from human activities. Soil carbon sequestration is the most promising mechanism to achieve the global mitigation goals and reduce GHG emissions. This is crucially potential because soils store twice the amount of carbon compared to atmosphere and vegetation. Increasing organic content of soils can potentially sequester large amount of CO₂, and improve soil quality. More focus should be put on capturing carbon in the soil. UN members should consider to promote behaviour changes of producers on land use and carbon sequestration in soil. Their awareness of sustainable agriculture and insight of having long term profitability are important to execute the better usage of land.

Problem Food waste

Solutions More efficient processing, packaging, healthy diets

Key Stakeholders Accountable Processors and retailers

Policy Incentive Taxing waste-flow of processors and retailers

Food waste is an urgent problem in the world. The FAO announced that 1.3 billion tons of food are lost or wasted yearly. Such a big amount waste of food is not only generated by the bad food habits of consumers, but also because of inefficient processing and retail. Solutions to face this food waste challenge, for instance, is more efficient processing, shorter and better packaging from farmer to consumers, better retail management by retailers, as well as healthier diet for consumers. To achieve less food waste at the production side, retailers as important and steering actor in the supply chain, can be hold accountable in empowering producers, processors and traders to prevent post harvest loss. The policy incentive is to tax retailers by their waste-flow. A focus on the retailers will have a huge impact because the division of power is mostly in the hand of the processors and retailers to get maximum margin profits of food. This policy incentive is intended to encourage processors and retailers to run their business in a more efficient way, to reduce food waste to its maximum potential.

Problem Water scarcity

Solution Horticulture in greenhouses

Key Stakeholders Accountable Banks and investors

Policy Incentive Financial incentives on high tech greenhouses

The long-term sustainable use of water resources is of growing concern. Although there is no global water scarcity as such, an increasing number of regions are chronically short of water. Other regions suffer the consequences of unmet demand due to infrastructure or institutional inadequacies. In the last century, water use grew dramatically as the food production has increased more than 100 percent. Besides, increasing variability in rainfall can influence the flow of water in surface systems and the rates of recharge and discharge from aquifers. Water demand is therefore set to increase. FAO projects that irrigate food production will increase by more than 50 percent by 2050, but the amount of water withdrawn by agriculture can increase by only 10 percent, provided that irrigation practices are improved and yields increase, or that other high-tech innovations in crop production reduce essential water use. Horticulture in greenhouses are a good CSA solution as it enables farmers to grow off-season or year-round even in extreme climate conditions. Greenhouses are very resource-

use efficient with near closed cycles of nutrients, inputs and water use. Additionally, rainwater is stored and re-used after water purification which can help increase the water-use efficiency in agriculture. UN members are advised to promote investment on implementation of high tech greenhouse technology by reducing interest on loans to innovative producers. Banks and financial agencies play an important role in this, to support both big farmers or small farm holders' cooperation in arid areas with water scarcity.

Problem Lack of capacity

Solution Improve people's adaptive capacity

Key Stakeholders Accountable Governments and academia

Policy Incentive Invest 0.5% of GDP on capacity building to develop CSA

In addressing the interlinked challenges of climate change and food security addressing the lack of organization and capacity to deal with climate change is essential. On the one hand it relates to a simple lack of knowledge and knowhow, while simultaneously the capacity to act upon certain knowledge is lacking, for example the capacity to acquire financial means to buy relevant tools and machinery. The lack of organization and capacity is a key problem, as it indicates that people want change, but cannot because of their circumstances, do not have the capacity to act upon this tending for change. Lacking capacity can be resolved by improving people's adaptive capacity, which can be achieved by education and training and extension. This concerns both the government, as it concerns the lack of organizational capacity, which should be provided for within good governance, and also academia and education institutes on all levels to provide adequate teachings and learnings. Furthermore, government and research need to join forces to improve the adaptive capacity of citizens. Capacity building can be obtained by the execution of the policy that every country should invest 0.5% of their GDP on capacity building to develop CSA.

Outlook

The policy incentives have the potential to significantly contribute to the ambitious aim of limiting the global temperature rise to 1.5 degrees Celsius on top of pre-industrial levels. If the United Nations advises countries to implement these CSA incentives (promote behaviour changes of farmers, taxing waste-flow processors and retailers, financial incentives on high tech greenhouses, capacity building), the contribution of agriculture to climate change can be diminished, and people are better able to adapt to the effects that climate change has on agriculture.