Sida

Climate Smart Agriculture

INFORMATION BRIEF

MARCH 2017

Climate Smart Agriculture

The 2030 Agenda calls for us to make our agriculture[1] and food systems more efficient and sustainable, and to shift to more sustainable consumption and production approaches.

Climate smart agriculture is a recent concept and approach launched by FAO in 2010 in response to the growing need for a clear and coherent strategy for managing agriculture and food systems under climate change to reach food security and development objectives.

WHICH ARE THE CHALLENGES?

The United Nations Food and Agricultural Organization (FAO) estimates that by 2050, agriculture will need to produce 60 per cent more food globally, and 100 per cent more in developing countries, if it is to meet demand at current levels of consumption. Food demand needs to be met primarily from productivity increase on existing agricultural land since opening up new land for agriculture carries major environmental costs. Hence, supporting the transformation to more sustainable production practices is a prerequisite for sustainable development.

Agriculture and food systems at every scale, from the farm to the global, have to improve and become more efficient in resource use (use less land, water and inputs to produce food more sustainably together with reducing food loss and waste) to meet the future challenges. To achieve this they also need to adapt to climate change and natural resource pressure, and contribute to mitigating climate change. As these challenges are interconnected, ideally, they have to be addressed simultaneously.

A VICTIM OR A DRIVER OF CLIMATE CHANGE?

Climate change will affect the conditions under which agricultural activities are undertaken. The difficulties to predict these changes make it hard to devise and promote precise adaptation measures. The most effective approaches are to reduce vulnerability and increase resilience of a given system.

Agriculture and food systems are not only victims but also a driver of climate change. Hence a more systematic transformation of agriculture and food policies is required. Most of the GHG emissions of the agricultural sector are directly driven by use of resources. The following three production factors have particular influence on total agricultural GHG emissions:

Area: Agriculture is a significant driver of deforestation. Deforestation and grassland being converted to cropland induces higher carbon dioxide (CO_2) emissions, and reduces capacity for carbon sequestration. Hence improvement of crop yields (productivity increase) rather than expansion of cropland should be prominent in any mitigation strategy.

Fertilizers: Nutrients are essential for crop production but CO_2 is generated in the production of synthetic fertilizers, which at field level is translated into nitrous oxide emissions[2]. Therefore it is essential to improve fertilizer efficiency and management, incl. switching from synthetic to organic fertilizers.

Livestock: – is a significant source of methane (CH4)[3] and nitrous oxide (N_2O) emissions. It also contributes to emissions indirectly through the production of fodder used for livestock. Considering the increasing global

1 Including crops, livestock, fisheries and forestry.
2 Nitrous oxide is emitted when nitrogen is added to the soil through the use of synthetic fertilizers. Nitrous oxide is also emitted during the breakdown of nitrogen in livestock manure and urine.
3 The comparative impact of CH4 on climate change is more than 25 times greater than CO_2.

demand for meat and dairy products, increased resource efficiency in livestock production is necessary.

WHAT ABOUT THE PRESENT FOOD PRODUCTION?

The current trajectory of growth in agricultural production and productivity is unsustainable. Agriculture and food production on land and in aquatic systems already dominates much of the global terrestrial surface, and has major negative impacts on the Earth's ecosystems.

Earlier emphasis on individual agricultural sectors (e.g. crops, livestock, forestry, fisheries, and aquaculture) with a primary focus on productivity improvements has created a "silo syndrome" in which the different sectors compete with each other for space, political support and natural resources, often resulting in sub-optimal allocation and management of resources.

HOW CAN RESOURCES BE USED AND PRODUCED BETTER?

Agriculture and food systems utilize a diverse range of resources to produce a diverse range of outputs (e.g. crops, meat, dairy) but also income and employment opportunities for farmers, laborers and the agro-industry as well as for the non-farm rural economy. These different outputs are equally important from a food security perspective.

Resource efficiency needs to be improved in every type of food system in order to maintain production systems within critical planetary limits; preserve the ecosystem services on which agricultural production relies, such as pollination, reduce land degradation, biodiversity loss and pressure on water use and quality. No matter what the system or scale is, there can be important improvements in management practices. Most of these improvements can be achieved by applying various already existing techniques such as enhancing soil quality, improving soil biodiversity, regulating carbon, oxygen and plant nutrient cycles, and enhancing resilience to drought and flooding.

WHAT IS CLIMATE SMART AGRICULTURE?

Climate Smart Agriculture (CSA) appeared as a concept on the policy agenda in 2009 and comes from an increased concern within the global development community in general, and within the FAO in particular, regarding the impacts of climate change on global food security, in combination with a steadily growing population, urbanization and consumption growth trends.

The definition of CSA, as agreed upon by many international institutions such as the UN, IFAD, the World Bank and CGIAR, is that it integrates the three dimensions of sustainable development (economic, social and environmental) by jointly addressing food security and climate challenges and is as such composed of three main pillars or goals:

1. Sustainably increasing agricultural productivity to support equitable increases in incomes, food security and development;
2. Adapting and building resilience to climate change from the farm to national levels;
3. Reducing and/or removing greenhouse gases emissions (GHG), where possible.

CSA is as such not a new agricultural system, nor a new set of practices. What is new is the integration of the three pillars/goals.

WHICH ARE THE CRITICAL VIEWS?

CSA is based on the idea of a 'triple win' capitalizing on the synergies between food security, adaptation and mitigation advocating an approach focusing on all three. When it comes to how this is interpreted by various actors, or how it translates into action at local level, it is however not as straightforward. Critical voices have argued that CSA leans on a poorly understood relationship between mitigation, adaptation and food, and hence serves to justify nearly any agricultural practice to be climate smart. Some civil society organisations further argues that CSA displaces mitigation responsibility from the global level and re-scales it onto local populations by situating the problem on the present and current agricultural practices. Further, within the civil society organisations there is some critique based on the interpretation of the concept and that it legitimises agro-industrial expansion.

HOW TO REACH SUSTAINABLE FOOD AND AGRICULTURE PRODUCTION?

In order to make agriculture more productive and sustainable, the FAO has suggested five interconnected principles for the transition toward sustainable food and agriculture. They have the ambition to balance the social, economic and environmental dimensions of sustainability in agriculture, and provide a basis for developing policies, strategies, regulations and incentives to guide the transition to sustainability, while promoting resilience through an adaptive response to shocks and opportunities.

Principle 1: Improving efficiency (productivity) in the use of resources is crucial to sustainable agriculture. A sustainable approach to intensification seeks to raise productivity through a balanced use of resources and inputs, harnessing the potential benefits of ecosystem services.

Principle 2: Sustainability requires direct action to conserve, protect and enhance natural resources. Policies and institutions will need to be strengthened in order to provide the enabling environment and incentives for

Mutinta Mwiinga is one of many small scale farmers in Zambia who has developed her farming and production through the Sida financed programme Musika.

Photo: Nyokabi Kahura

managing natural resources to reflect scarcities and their full ecological and social values.

Principle 3: Agriculture that fails to protect and improve rural livelihoods, equity and social wellbeing is unsustainable. Building an enabling environment that addresses both social and environmental issues presents major challenges. Policy and institutional responses are needed to reduce the trade-offs between social and environmental objectives.

Principle 4: Enhanced resilience of people, communities and ecosystems is key to sustainable agriculture. In the context of sustainable food and agriculture, resilience is the capacity of agro-ecosystems, farming communities, households or individuals to maintain or enhance system productivity by preventing, mitigating or coping with risks, adapting to change, and recovering from shocks.

Principle 5: Sustainable food and agriculture production requires responsible and effective governance mechanisms. A transition to sustainable agriculture requires enabling policy, legal and institutional environments that strike the right balance between private and public sector initiatives, and ensure accountability, equity, transparency and the rule of law.

While in theory the idea is simple, optimizing synergies is complicated. Shifting from trade offs to synergies requires knowledge of where synergies are possible, and political processes that support a redistribution of benefits and costs across different groups locally and globally, and between the long and short terms. It also requires innovative technologies, multidisciplinary interventions, and institutions that are geared to capturing synergies rather than maximizing individual objectives.

A practical approach, related to CSA, that has gained momentum during the last couple of years is the **Agroecology** concept. According to FAO, Agroecology is a scientific discipline, a set of practices and a social movement. As a science, it studies how different components of the agroecosystem interact. As a set of practices, it seeks sustainable farming systems that optimize and stabilize yields. As a social movement, it pursues multifunctional roles for agriculture, promotes social justice, nurtures identity and culture, and strengthens the economic viability of rural areas.

IMPORTANT TO KEEP IN MIND

The national ownership: The National Adaptation Programmes of Action (NAPA), and at a more aggregate level the Nationally Determined Contributions (NDCs), prepared by the least developed countries provide a rich panorama of adaptation priority measures. Many of these priority projects are linked to agriculture. These projects are of special interest and relevance because they have been designed and prioritized by the countries themselves.

CSA is not prescriptive: The recommended approach to CSA is to identify and promote the most suitable strategy for local conditions. Site-specific analyses are needed to identify potential practices under various climatic conditions. This does not imply that every practice and measure, every farmer, in every field will contribute to all three objectives.

The involvement of all stakeholders: Addressing food security and climate change requires concerted and coordinated involvement and action of many actors, farmers, private sector, and public actors national and international and civil society organisations. This can be especially challenging as they are different and may have conflicting objectives. Of particular importance is to acknowledge the role and knowledge of women and promote their involvement at all levels.

A long-term perspective and commitment: Integrating food security and climate change concerns has to be done at every level and pursued at different scales by all concerned stake-holders (incl. donors). Due to the urgency of the issue work has to be done on a day-to-day basis at farm level to reach short-term outcomes. It also has to be done with a long-term perspective and political commitment at the landscape and country level to design locally specific, coherent, inclusive and cohesive policy packages.

WHAT SHOULD SIDA PROMOTE?

The CSA elements of transparency, ownership and stakeholder participation, are fundamental principles in all Sida's operations, and should be emphasized CSA as well.

Sida as a donor agency can promote the application of the CSA concept in several ways such as when supporting sub-components in broad development programmes:

- Sustainable management of natural resources (e.g. support to projects involving land management, biodiversity and water resources),
- capacity building (e.g. of land, agricultural, forest institutions, local authorities, universities as well as private sector actors and farmers),
- research, economic development and capital goods (e.g. research, services for financial and market access, entrepreneurship, value chain development, migration from subsistence farming to income generation and small-scale commercial farming).

QUESTIONS TO ASK IN THE ASSEEMENT

Identifying climate risks and opportunities early on in the contribution cycle means they will be more effectively addressed. As for all Sida supported programmes, the partner should make an environmental assessment during the programming phase that should include considerations of relevant country strategy documents (such as NAPAs) and specific sector assessments.

Important issues to map and analyse include the following:

- What are the nature, magnitude and severity of environmental degradation caused by agriculture (e.g. erosion, deforestation and loss of biodiversity, hydrological impacts, GHG emissions and water pollution)?
- What are the nature, magnitude and severity of impact on agriculture that climate change have and is likely to have (e.g. reduced productivity and crop loss due to droughts and floods)?
- What are the strategies used by farmers to manage risks and their impact on the environment? Are farmers e.g. seeking quick return solutions or do they engage more in long term investments to maintain or enhance land productivity? Do men and women have different strategies?
- Will the planned activities contribute to sustainable land use practices? Is there a risk for increased pressure on land due to e.g. population growth, competition for land, water and other natural resources; illegal logging? Are policies for land management promoting land conversion due to e.g. urbanization?
- What obstacles are there for sustainable land management practices? Are there e.g. available and competent extension services, access to financial services for investments in improvement and secure land rights?
- Are there underlying reasons for vulnerability to climate change and extreme events? Are there e.g. lack of alternative/supplementary income opportunities, dependence on crops/varieties, which are not drought tolerant, poor access to weather information and warning systems and poor access to insurance?
- Are there opportunities and locally available capacities? Is there e.g. traditional knowledge, local agro-biodiversity and varieties adapted to local conditions; new opportunities such as income generation from ecosystem services. It is important to consider the different roles and capacities men and women might have.

For references please contact Sida's unit for policy support.

Art.no.: sida62024en, urn:nbn:se:Sida-62024en Print: Edita 2017

SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
Address: SE-105 25 Stockholm, Sweden. Office: Valhallavägen 199, Stockholm
Telephone: +46 (0)8-698 50 00. Telefax: +46 (0)8-20 88 64
E-mail: info@sida.se. Homepage: http://www.sida.se

Sida