

The rise in Climate-Smart Agriculture strategies, policies, partnerships and investments across the globe

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Abstract

Since the term 'climate-smart agriculture' (CSA) was coined in 2010, a growth in strategies, policies, partnerships and investments in the area has been observed. Here we have summarised key CSA efforts globally and in South Asia, Southeast Asia, East Africa, West Africa, and Latin America. We have interpreted CSA in the broad sense, including efforts which may not mention CSA but implicitly contribute to CSA pillars. We note that many international and regional organisations, and countries, are implementing policies and programmes promoting and upscaling CSA. While the growth in strategies, policies, partnerships and investments is positive and creates a favourable enabling environment for CSA, these need to be complemented with targeted implementation on the ground, sustainable financing, institutional coordination and metrics to measure the efficacy of interventions.

CSA strategies, policies, partnerships and investments at the global level

At the global level, the United Nations climate summit in 2014 saw the launch of several key efforts, including the *Global Alliance for Climate-Smart Agriculture (GACSA)* – a platform for knowledge exchange and inter-regional cooperation on CSA with over 140 members including governments, research institutions, farmers' organisations, the private sector, and NGOs. The World Bank committed to make its US\$ 8 billion

annual spending on agriculture, climate-smart by 2018 (UN, 2014). The International Fund for Agricultural Development (IFAD) also committed to include an element of climate risk screening in all its operations by 2018 (UN, 2014). In 2015, the private sector, under the umbrella of the World Business Council on Sustainable Development (WBCSD), committed to reduce by 50 percent the greenhouse gas (GHG) emissions from agriculture and land use by 2030, while making 50 percent more nutritious food available, and strengthening the climate resilience of agricultural landscapes and farming communities (WBCSD, 2015). Members of WBCSD, including *Olam, Pepsico, Monsanto, and Wal-Mart*, have launched their own respective actions in support of these global commitments. The rise in usage of 'CSA' can be seen in the phenomenal increase in the number of publications which refer to CSA (Figure 1), indicating the growing knowledge base on the topic.

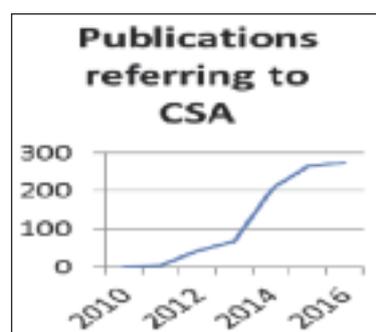


Figure 1. Numbers of publications referring to CSA (based on a search for the term in Google Scholar).



Table 1. CSA strategies, policies, partnerships and investments globally.

<i>Global Alliance for Climate-Smart Agriculture</i>	A voluntary coalition of over 140 members including governments, research institutions, farmers' organisations, the private sector, and NGOs, for knowledge sharing and cross-regional collaboration on CSA
The World Bank: <i>Scaling up CSA for Impact</i>	Mainstreaming CSA across its entire annual agricultural portfolio of US\$ 8 billion.
IFAD: <i>Small Farms, Big Impacts: helping smallholder farmers adapt to climate change</i>	Mainstreaming climate change considerations into all its new investments by 2018.
CGIAR Research Programme on <i>Climate Change, Agriculture and Food Security (CCAFS)</i>	Committed to reach 11 million farm households with CSA by 2022, in collaboration with partners.
<i>'4 per 1000' initiative</i>	Aims to increase soil carbon sequestration, and support the transition towards a productive, resilient agriculture.
FAO	Supporting member countries in CSA implementation through technical assistance, and through targeted programmes.
<i>Climate and Clean Air Coalition (CCAC)</i>	Reducing methane and black carbon emissions from key agricultural sectors, and enhancing food security and improving livelihoods.
<i>Food Security Climate Resilience Facility</i>	Multilateral, multi-year, replenishable fund developed by the World Food Programme to build climate resilience.
<i>Pilot Programme on Climate Resilience (PPCR)</i>	Sectors of focus under this US\$ 1.2 billion funding window includes agriculture and landscape management (25%), water resources management (18%), and climate information services and disaster risk management (17%) (PPCR, 2016).
<i>Building Resilience and Adaptation to Climate Extremes and Disasters</i>	United Kingdom Department for International Development (DFID) funded programme which supports actions in South and Southeast Asia, and the African Sahel to increase resilience to climate change impacts.
<i>WBCSD CSA Initiative</i>	Aims to reduce by 50% the GHG emissions from agriculture and land use by 2030, while making 50% more nutritious food available, and strengthening the climate resilience of agricultural landscapes and farming communities.

These efforts by global players (Table 1) are in direct response to the high priority accorded to agriculture by countries in their Nationally Determined Commitments (NDCs) to the Paris Climate Agreement. Twenty-nine countries explicitly highlighted CSA in their NDCs and 119 countries identified climate change mitigation in agriculture to be a priority. Of the 138 countries which included adaptation actions, 127 indicated agriculture as a priority sector (Richards *et al*, 2016).

CSA strategies, policies, partnerships and investments in South Asia

There is a growing emphasis on CSA in Asia, for example, the Asian Development Bank (ADB) committed to double its annual climate financing to US\$ 6 billion by 2020, of which US\$ 2 billion is allocated for adaptation, including through CSA (ADB, 2015). In South Asia (Table 2), countries which have piloted and scaled-up CSA include India, Bangladesh and Nepal. In India, the *National Mission for Sustainable Agriculture (NMSA)* is one of the eight key Missions outlined under the *National Action Plan on Climate Change*. It aims to enhance agricultural productivity, especially in rain-fed areas, through integrated farming, water use efficiency, soil health management and resource conservation. The *National*

Innovations on Climate Resilient Agriculture (NICRA) programme supports nationwide effort through research and piloting, and has established over 150 Climate Resilient Villages across the country (Rao *et al*, 2016). In Nepal, the new *Agriculture Development Strategy* aims to promote a range of CSA technologies through its extension system. In Bangladesh, a national work-plan for scaling up *Alternate Wetting and Drying*, a CSA practice, has been produced. Bangladesh will engage a World Bank US\$ 214 million agricultural technology programme, involving 1 million farmers, in implementation of the work-plan.

The concept of Climate-Smart Villages (CSVs) – portfolios of CSA technologies, practices and services promoted in collaboration with the local community and organisations – is gaining traction in the region. The Indian states of Haryana, Maharashtra and Madhya Pradesh aim to scale up CSVs in over 2000 villages. In Nepal, the Government has highlighted implementing the CSV concept as part of national efforts to adapt to climate change.

Table 2. CSA strategies, policies, partnerships and investments in South Asia.

Asian Development Bank	Committed to double annual climate financing to US\$ 6 billion for Asia-Pacific by 2020, US\$ 2 billion will be for ad aptation including through CSA.
<i>National Mission for Sustainable Agriculture, India</i>	Supports climate change adaptation and mitigation research, pilot and model projects, to develop climate-smart management practices and integrated farming system models suitable to specific agro-climatic conditions.
<i>National Innovations on Climate Resilient Agriculture, India</i>	Aims to enhance resilience of Indian agriculture to climate change and climate vulnerability through strategic research and technology demonstration.
Climate-Smart Villages (CSVs) in India and Nepal	CSVs are being scaled-up in over 2,000 villages in the Indian states of Haryana, Madhya Pradesh and Maharashtra. The Government of Nepal has started to pilot and scale-out the CSVs approach in different agro-ecological zones from 2016.
<i>National Solar Mission of India</i>	Targets renewable energy generation of 175 gigawatts by 2022. Also supports the replacement of fossil fuel based water pumps for agricultural use to solar pumps.
<i>Renewable Energy Promotion Policy in Nepal</i>	Aims to provide support for water pumping systems in irrigation managed by individuals, a community or a private company.
<i>Agriculture Development Strategy of Nepal</i>	Aims to improve capacity of extension staff and farmers in CSA practices.

CSA strategies, policies, partnerships and investments in Southeast Asia

In Southeast Asia (Table 3), the Association of Southeast Asian Nations (ASEAN) Ministers of Agriculture and Forestry (AMAF) have taken the lead by endorsing regional guidelines for promoting CSA in 2015. These guidelines provide an enabling framework for implementing CSA in the region, and are supported by national and local efforts. Countries including Cambodia, Myanmar, Philippines and Vietnam, have adopted

national CSA related policies and programmes. The shared vulnerability to the effects of climate change of many Southeast Asian countries is encouraging cross-country and inter-regional collaboration and knowledge exchange. Regional effort and knowledge exchange on CSA is being facilitated by the *ASEAN Climate Resilience Network*. The Southeast Asian Regional Centre for Graduate Study and Research in Agriculture (SEARCA) has also developed a framework programme for partners (*eg the Southeast Asian University Consortium for Graduate Education in Agriculture and Natural Resources (UC)*).

Table 3. CSA strategies, policies, partnerships and investments in Southeast Asia.

<i>ASEAN Regional Guidelines for Promoting CSA Practices</i>	Provides voluntary guidelines for countries in Southeast Asia for scaling-up of CSA practices.
<i>ASEAN Climate Resilience Network</i>	A platform for regional exchange, particularly for sharing information, experiences, and expertise on CSA.
<i>SEARCA Climate Change Adaptation and Mitigation Programme for Agriculture and Natural Resource Management in Southeast Asia (SEARCA's CChAM) Umbrella programme</i>	SEARCA's <i>Climate Change Adaptation and Mitigation (CChAM) Framework</i> is envisioned to contribute to the twin goals of food security and poverty reduction through ensuring climate change resilience in the agricultural production and sustainable natural resources management in Southeast Asia.
<i>Myanmar Climate-Smart Agriculture Strategy</i>	Focuses on technical, policy and investment conditions to achieve sustainable agricultural development for food security and nutrition through climate-resilient and sustainable agriculture.
<i>Vietnam 20-20-20 programme</i> . Reduction of GHG emissions in agriculture and rural areas by 2020	Issued in 2012, the programme aims to reduce total GHG emissions from agriculture and rural development sector by 20% by 2020, while growing the sector's productivity and reducing poverty through the application of CSA.
<i>Cambodia's Climate Change Priorities Action Plan for Agriculture, Forestry and Fisheries 2014-2018</i>	Promoting and scaling-up CSA is part of the priority actions identified in the plan. The plan is currently being implemented with support from multi-sectoral partners and donors.



CSA strategies, policies, partnerships and investments in East and Southern Africa

In East and Southern Africa (Table 4), a number of CSA initiatives are closely linked with continent-wide initiatives. The *New Partnership for Africa's Development (NEPAD)* agency is leading the implementation of the African Union-NEPAD *Agriculture Climate Change Programme*, which aims to have 25 million farm households practising CSA by 2025 (GACSA, 2016). A key continental initiative supporting this effort is the Africa CSA Alliance, a partnership between NEPAD Agency and five international NGOs (CARE, Catholic Relief Services, Concern, Oxfam, and World Vision), and linking closely with previous continental initiatives to transform agriculture in Africa, such as the *Comprehensive Africa Agriculture Development Programme (CAADP)*. The Alliance aims to reach at least 6 million farm households with CSA thus contributing to NEPAD's 2025 goal of reaching 25 million farm households (GACSA, 2016). The *Africa Climate Business Plan (ACBP)* launched at COP 21 in Paris represents the World Bank's contribution to reduce Africa's adaptation gap by deploying technical expertise, mobilising financing and facilitating the engagement of stakeholders towards climate action. By 2026, the ACBP aims to support the adoption of CSA practices by 25 million African farmers, on 3 million hectares of farmland, and improve CSA policy implementation

capacity in at least 20 countries (World Bank, 2015).

Recently a new CSA programme, now known as *VUNA* ('harvest'), has been initiated in East and Southern Africa. *VUNA* is a £23 million DFID-funded programme that aims to transform agricultural systems in East and Southern Africa to be suitable for the changing climate (*Editor's note: see also Newsflash 1*). *VUNA* supports smallholder farmers to adapt to climate change, and also supports achievement of national and regional priorities to transform agriculture in the face of climate change, which aligns with the CAADP pillars.

The three Regional Economic Communities, Common Market for Eastern and Southern Africa (COMESA), East African Community (EAC), and Southern Africa Development Community (SADC) collaborate on a project that is supporting adoption of conservation agriculture, supporting investments in national CSA programmes, and addressing the linkages between agriculture, forestry and land use and *Reduced Emissions from Deforestation and Degradation (REDD)*. The goal is to bring significant livelihood and food security benefits to at least 1.2 million small-scale farmers.

At the national level, Kenya, Uganda, Tanzania, Botswana and Namibia have developed *CSA Framework Programmes (CSA-FPs)*, a joint initiative supported by CCAFS, the World Agroforestry Centre (ICRAF), the International Centre for Tropical Agriculture (CIAT), NEPAD and COMESA. The *CSA-FPs* aim to support countries to synergise their *National Agricultural Investment Plans (NAIPs)* and agricultural sector programmes with national

Table 4. CSA strategies, policies, partnerships and investments in East and Southern Africa.

<i>AU-NEPAD Agriculture Climate Change Programme</i>	Aims to have 25 million farm households practising CSA by 2025.
<i>Africa CSA Alliance</i>	Supports the scaling-up of CSA practices to at least 6 million farming households.
<i>Africa Climate Business Plan (ACBP)</i>	Supports the adoption of CSA practices by 25 million African farmers, on 3 million hectares of farmland, and improve CSA policy implementation capacity in at least 20 countries.
<i>VUNA</i>	£23 million DFID-funded programme that supports smallholder farmers to adapt to climate change. Initial focus on Malawi, Mozambique, Tanzania, Zambia and Zimbabwe.
<i>Adaptation of African Agriculture Initiative</i>	Aims to mobilise US\$ 30 billion for adaptation in the agriculture sector in Africa. Focal areas include management of soils, agricultural water and climate risks.
<i>African Development Bank Feed Africa strategy</i>	Focuses on providing funds to support climate-smart agricultural practices.
<i>Climate Resilient Green Economy (CRGE) Strategy, Ethiopia</i>	Through this strategy, Ethiopia aims to achieve carbon-neutral middle-income status before 2025. The strategy aims to improve crop and livestock production.
<i>Uganda Climate-Smart Agriculture Programme (2015-2025)</i>	The vision for this programme is climate-resilient and low-carbon agricultural and food systems contributing to increased food security, wealth creation and sustainable economic growth in line with the <i>National Vision 2040</i> .
<i>Agriculture Climate Resilience Plan (ACRP) 2014-2019, Tanzania</i>	The ACRP addresses increasing economic, social and climatic impacts accelerated by climate change, and invokes CSA as a central approach to increasing yield and mitigating economic shocks at the smallholder farm level.
<i>Country Climate-Smart Agriculture Framework Programmes (CSA-FP)</i>	Identifies strategic priorities for agricultural development and growth in a changing climate, and aligned with the AU/NEPAD <i>Comprehensive Agriculture Development Programme (CAADP)</i> and national strategies and policies.

climate change strategies and action plans in order to ensure a common and holistic approach. In addition, Kenya and Tanzania are also in the process of developing national CSA strategies. In Ethiopia, climate change has been mainstreamed into various national policies, strategies and programmes. In particular, the *Climate Resilient Green Economy (CRGE)* initiative, which is supported by the *Green Economy Strategy (GES)* and the *Climate Resilience Strategy (CRS)* focuses on improving crop and livestock production practices for greater food security and better income for farmers, while reducing emissions.

CSA strategies, policies, partnerships and investments in West Africa

In addition to the continental initiatives outlined above, in West Africa (Table 5), the *West African CSA Alliance (WACSAA)* was established by the Economic Community of West African States (ECOWAS) in 2015 to support efforts in the region. The *Promotion of Smart-Agriculture towards Climate Change and Agro-ecology transition in West Africa* is a regional initiative led by ECOWAS and covers 15 countries. The initiative aims to ensure adoption of CSA practices by 25 million households by 2025, and includes two steps: firstly, the spread of best practices through public policies (involvement of public services in charge of agricultural and environmental policies) and, subsequently, farmers' training and support by NGOs and producers (involvement of producer organisations and operators).

Regional efforts are complemented by national and local efforts. These include efforts by Senegal to provide better climate

information to farmers, Ghana's *National CSA action plan*, and Nigeria's *National Agricultural Resilience Framework*.

CSA strategies, policies, partnerships and investments in Latin America

During COP21 in Paris, the Central American Agricultural Council, represented by the Ministers of Agriculture of Costa Rica and Guatemala, declared its full commitment to promote CSA as the approach to face climate challenges in agriculture in the region. As a result of the commitment, a *CSA Strategy* is being formulated for eight countries in Central America and the Caribbean. This *CSA Strategy* is being articulated with the *Central America Climate Change Regional Strategy*, which was formulated in 2010, in order to address threats and promote opportunities that climate change and variability are imposing on the population. The *Climate Change Strategy* also constitutes a guiding mechanism to implement complementary measures and actions at regional level that add value to national initiatives.

In addition to regional efforts (Table 6), national initiatives include Colombia's efforts to enhance the competitiveness of its agricultural sector. By working hand-in-hand with research institutes and the private sector, the government of Colombia has avoided 30 percent of total losses (US\$ 50 million) in crops such as rice and maize due to climate variability. In Brazil, their *Low-Carbon Agriculture (ABC) Plan* aims to rehabilitate 15 million hectares of degraded pastures and to increase the area under zero tillage from 25 million hectares to 33 million

Table 5. CSA strategies, policies, partnerships and investments in West Africa.

<i>AU-NEPAD Agriculture Climate Change Programme</i>	Aims to have 25 million farm households practising CSA by 2025.
<i>Africa CSA Alliance</i>	Supports the scaling-up of CSA practices to at least 6 million farming households.
<i>Africa Climate Business Plan (ACBP)</i>	Supports the adoption of CSA practices by 25 million African farmers, on 3 million hectares of farmland, and improves CSA policy implementation capacity in at least 20 countries.
Scaling out CSA in Senegal using climate information services	Innovative dissemination of climate information through community radio and SMS text messages.
<i>West African CSA Alliance</i>	Aims to increase productivity and farm incomes sustainably and equitably, to enhance adaptation and resilience to climate variability and change, and control and/or reduce GHG emissions wherever possible and appropriate.
<i>Adaptation of African Agriculture Initiative</i>	Aims to mobilise US\$ 30 billion for adaptation in the agriculture sector in Africa. Focal areas include management of soils, agricultural water and climate risks.
<i>National Agricultural Resilience Framework of Nigeria</i>	Seeks to minimise climate risks associated with Nigeria's ambitions to promote rural development through export led agriculture.
<i>National Climate-Smart Agriculture and Food Security Action Plan, Ghana</i>	Aims to translate the national goals and objectives on CSA, into action on the ground, through sound implementation of programmes in the respective agro-ecological zones and in various districts.
<i>Promotion of Smart Agriculture Towards Climate Change</i>	A regional initiative led by ECOWAS and covering 15 countries. Aims at the adoption of CSA practices by 25 million households by 2025.



Table 6. CSA strategies, policies, partnerships and investments in Latin America.

<i>Climate-Smart Agriculture Strategy for Central America and Dominican Republic</i>	A <i>CSA Strategy</i> is being formulated for eight countries in the region.
<i>Climate Change Regional Strategy</i>	An initiative that seeks to combine efforts in Central American countries to face current and future climate challenges.
<i>Climate and the Colombian Agriculture Sector: Adaptation for a Productive Sustainability</i>	Seeks to enhance the competitiveness of the Colombian agricultural sector through the implementation of policy instruments, strengthening the investment of resources for research, technological development and innovation.
<i>Brazil's Low-Carbon Agriculture (ABC) Plan</i>	Credit initiative that provides low-interest loans to farmers for CSA practices such as no-till agriculture, restoration of degraded pasture, treatment of animal wastes and the integration of crops, livestock and forest.

hectares by 2020. It also intends to reduce its emissions by 160 million tonnes of CO₂ equivalent annually, before 2020.

Conclusions

A number of strategies, policies, partnerships and investments have been initiated to put the CSA concept into practice, at the global, regional and national levels. Many of these efforts are in early stages and their impacts cannot yet be fully quantified, however, some general lessons can be drawn to ensure the success of these efforts.

Firstly, the experiences from Africa, Southeast Asia and Latin America show that regional cooperation and knowledge exchange between countries is key to success. Efforts to foster regional cooperation, particularly through South-South cooperation, should be pursued further.

Secondly, CSA actions are context-specific and will vary depending on regional, national and local priorities. For example, in South Asia, the key areas of emphasis include scaling-up CSVs and renewable energy, whereas in East and West Africa, there is greater emphasis on increasing resilience of smallholder farmers. Therefore, effective targeting and prioritisation is needed to ensure success of CSA strategies, policies, partnerships and investments.

Thirdly, success of these efforts will depend on the sustainability of financing. Although several major commitments have been made by international financial institutions, the private sector, development agencies, and national governments, many of the efforts are funded for short periods only (two to five years). A long-term view is needed to allow farmers to grasp concepts fully, as well as to realise the benefits of these interventions.

Fourthly, while private sector efforts are prominent at the global level, they are limited at the regional and national levels, with most efforts led by Governments or international organisations. There is a need for more involvement of the private sector at the regional and national levels, including with small and medium enterprises and micro-insurance schemes.

Lastly, while the interest in CSA is extremely positive and provides a favourable enabling environment for scaling-up CSA, success should be measured using rigorous metrics, and sound monitoring and evaluation approaches need to be integrated into implementation efforts.

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