

ON KNOWLEDGE: 3

Climate-smart agriculture and the need to scale up

Why South Asia needs a new approach to agriculture

As a region, South Asia has one of the world's highest incidences of food insecurity and poverty. Climate, population growth and agricultural investment trends combine to exacerbate the situation. Recent assessments suggest that:

- By 2050, South Asian rice production is set to fall by 14%, wheat production by up to 49% and maize production by up to 19%²
- At the same time, the South Asian rural population is expected to peak in the next 20 years or so³
- Due to the impact of climate change, the region's agricultural sectors need an estimated US\$1.5 billion per year just to maintain current productivity levels.⁴

Photo: Nate Derrick / Shutterstock.com



This briefing looks at climate-smart agriculture (CSA)¹, which is a holistic approach to the problems of food security, climate resilience and climate mitigation. South Asia has seen successful CSA initiatives. However, there is a pressing need to scale up CSA so that the region's farms, agricultural systems and landscapes are managed according to CSA principles. Governments can play a critical role in overcoming the barriers that currently prevent this from happening.

¹ The term climate-smart agriculture (CSA) was first used by the Food and Agriculture Organization of the United Nations (FAO).

About the series

The ACT on knowledge series focuses on key emerging issues related to climate change and how they affect South Asia. Each leaflet synthesises existing knowledge on a topic and aims to stimulate discussion. Suggestions for further reading are provided at the end. Please see the full list of topics at www.actiononclimate.today

CSA: an integrated approach

CSA is an integrated approach suited to meeting the food security, demographic and climate challenges that confront South Asia. It involves developing technologies, policies and institutions, mobilising investments and bringing all these into alignment in pursuit of these three goals:

Goal 1: Increase agricultural productivity and incomes in a sustainable manner

In South Asia, as in other regions, intensive cropping has resulted in degraded land, depleted groundwater and less biodiversity. More food and income needs to be produced and more paid work needs to be created, while at the same time using fewer resources and reducing greenhouse gas emissions.

² Nelson et al. (2009).

³ IFAD (2011) cited in Food and Agriculture Organization of the United Nations (2013).

⁴ Nelson et al. (2009).

Goal 2: Improve resilience to climate variability and extremes

Climate change affects agriculture mainly through changes in rainfall distribution, affecting rainfed crops directly and irrigated crops indirectly. However, the impact of climate change in specific locations cannot be predicted very accurately. It follows that the priority should be to improve rural populations' ability to cope with and adapt to general uncertainty rather than any specific type of change. The physical and biological aspects of agricultural systems are important, but so are economic and social factors. For instance, in some contexts changes in gender relations that enable female farmers to make critical adaptation decisions reduce household vulnerability. Improving education levels for farmers should have the same effect.

Goal 3: Reduce and/or remove greenhouse gas emissions

Agriculture is a significant source of greenhouse gas emissions, mainly in the form of methane and nitrous oxide. Many agricultural processes (such as growing rice by the paddy system) and practices (such as applying fertilisers)

produce emissions. However, while reducing emissions in order to mitigate climate change is an important CSA goal, in developing countries it must take second place to improving food security and climate resilience.

CSA has certain salient features that help to define it:

CSA is a new approach

CSA overlaps with the concepts of sustainable agriculture and disaster risk reduction, and some CSA techniques, such as rainwater harvesting, have been practised in South Asia for centuries. So is CSA a case of 'old wine in new bottles'?

What is different about CSA is its emphasis on climate risks, and the fact that CSA responds to several challenges at the same time.

CSA needs to be tailored to contexts

CSA is not a 'one size fits all' set of practices. In any specific location, its form is defined by the context and the associated priorities. This means that CSA initiatives may seem very different from one another, as in the case of the examples mentioned in the next section.

Photo: Nate Derrick / Shutterstock.com



CSA needs coordination on a grand scale

The CSA approach can be applied on a single farm to provide resilience benefits to an individual farmer. However, it also needs to be applied over entire landscapes, agricultural systems and food systems. This means it requires coordination across different agricultural sectors, as well as throughout related sectors such as energy and water.

CSA successes in South Asia and the need to scale up

In South Asia, as in other parts of the world, pockets of good CSA practice are showing what can be achieved, as in the following examples:⁵

Integrated Agrometeorological Advisory Services (India)

Integrated Agrometeorological Advisory Services (IAAS) provides weather forecasts and agricultural advice to around 2.5 million farmers, mainly on their mobile phones. The information enables them to make informed decisions on the timing of activities such as harvesting. It also encourages them to change their water management and disease control practices and to adopt improved post-harvest technologies. Bulletins are issued at national, state and district levels, and information is disseminated through the mass media. Farmers, agricultural scientists and weather scientists are brought together and groups of farmers regularly provide feedback on project services. These activities are strengthening resilience to the effects of climate change and increasing productivity. It was recently estimated that the project has had an economic impact of more than US\$10 billion.⁶

System of Rice Intensification (Afghanistan)

The System of Rice Intensification (SRI) is an organic, labour-intensive method of growing rice with only a small amount of water. It increases productivity and improves the crop's resistance to drought and water-logging. Originally developed in Madagascar, SRI has spread to other rice-farming areas. After SRI training was provided to Afghan farmers, some yields doubled and water use was reduced by up to 50%.

Urea deep placement (Bangladesh)

Urea is a cheap form of nitrogen fertiliser commonly used in rice cultivation. The conventional broadcast method is associated with high nitrogen losses. An alternative method, urea deep placement, involves making urea into small bricks and burying them 7–10 cm deep after paddy rice has been transplanted. This method reduces nitrogen losses, uses about 25% less urea and yields about 25% more rice. The technique has been widely adopted in Bangladesh, resulting in: higher farmers' incomes, the creation of paid work, including for poor rural women, a reduction in national urea imports and lower greenhouse gas emissions.

The need to scale up and how governments can help

Thanks partly to the success of initiatives such as IAAS in India and SRI in Afghanistan, the basic principles that underpin CSA are generally accepted by governments and other agricultural actors. Yet CSA is still not widely used in South Asia. There are several reasons for this. One is that there is no universal CSA programme that can easily be rolled out everywhere: as the examples above show, CSA takes different forms in different contexts. Also, like any type of innovation that requires farmers to adopt new methods and technologies, CSA faces well-known barriers such as insecure land tenure, farmers' risk aversion, difficulties in obtaining credit and the lack of information.

CSA will only succeed on a large scale if the full range of agricultural stakeholders, including public bodies, agro-industrial firms, retailers and consumers, are involved. National governments, and in India's case state governments too, play a critical role. They can facilitate scaling up by providing direction and support in these important areas:

Developing and implementing coherent policies

Implementing CSA on a large scale requires a coherent and integrated policy environment. Governments can promote CSA directly by mainstreaming it into core programmes and processes such as agricultural extension and watershed management. Governments can also create enabling environments that foster the kind of innovation that CSA requires. For instance, working with the private sector to establish crop insurance schemes can help to provide security for farmers, so that they become more willing to take risks by trying new agricultural techniques.

Strengthening and expanding institutions

Smallholder farmers in particular need strong institutions that will support them to change their agricultural strategies and practice. For example, governments need to support the creation of networks and platforms for disseminating and sharing information, as in the case of IAAS.

Boosting and reorientating investment

There is a pressing need both to increase public investment in agriculture and to redirect it towards long-term sustainable intensification. Investments in agricultural sectors need to incorporate climate change adaptation and mitigation objectives. This may pave the way to new sources of international investment, such as through the United Nations Framework Convention on Climate Change (UNFCCC). Supporting agricultural markets, providing credit, and rewarding farmers for environmental services are also important financial mechanisms for promoting CSA.

⁵ See Food and Agriculture Organization of the United Nations (2013) for more information on these and other CSA initiatives.

⁶ Bhalla (2012), cited in Cooper et al. (2013).

KEY MESSAGES

- CSA is an integrated approach for addressing food security, climate resilience and climate mitigation
- Implementation of CSA is still patchy, because various difficulties have prevented it from being practised widely
- Scaling up is an urgent priority in South Asia because of the region's high levels of food insecurity and poverty, and its vulnerability to the impact of climate change
- South Asian governments can help to ensure that CSA is adopted more widely by putting in place policies and institutions that will support investment in CSA
- A relatively simple 'quick win' for governments would be to learn from, and if appropriate replicate, successful CSA initiatives, for instance agrometeorological advisory services.

Sources and further reading

Cooper, P.J.M., S. Cappiello, S.J. Vermeulen, B.M. Campbell, R. Zougmore and J. Kinyangi (2013). Large-scale implementation of adaptation and mitigation actions in agriculture. CCAFS Working Paper no. 50. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Food and Agriculture Organization of the United Nations (2013). Climate-smart agriculture sourcebook. Rome: FAO.

Food and Agriculture Organization of the United Nations, the Consultative Group for International Agricultural Research and the Research Program on Agriculture, Climate Change and Food Security (n.d.). Knowledge on Climate Smart Agriculture: Questions and Answers.

https://cgspace.cgiar.org/bitstream/handle/10568/42432/About%20CSA_Q%26A.pdf?sequence=1

Nelson, G.C., M.W. Rosegrant, J. Koo, R. Robertson, T. Sulser, T. Zhu, C. Ringler, S. Msangi, A. Palazzo, M. Batka, M. Magalhaes, R. Valmonte-Santos, M. Ewing and D. Lee (2009). Climate Change: Impact on Agriculture and Costs of Adaptation. Washington: International Food Policy Research Institute.

Nelson, G.C., M.W. Rosegrant, A. Palazzo, I. Gray, C. Ingersoll, R. Robertson, S. Tokgoz, T. Zhu, T. Sulser, C. Ringler, S. Msangi and L. You (2010). Food security, farming, and climate change to 2050: scenarios, results, policy options. Washington: International Food Policy Research Institute.

Organisation for Economic Co-operation and Development (2001). Adoption of technologies for sustainable farming systems: Wagenin workshop proceedings.



E: info@actiononclimate.today

W: actiononclimate.today

f www.facebook.com/ActionOnClimate

t @act_climate



ACTION ON CLIMATE TODAY



Oxford Policy Management

Supported by

