Rainforest Alliance

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Summary of Climate-Smart Agriculture in the 2017 SAN Sustainable Agriculture Standard

The Rainforest Alliance works to conserve biodiversity and ensure sustainable livelihoods by transforming land-use practices, business practices, and consumer behavior.

233 Broadway, 28th Floor
New York, NY 10279-2899
tel: +1.212.677.1900
fax: +1.212.677.2187
rainforest-alliance.org

Introduction

Climate change fundamentally and increasingly affects agriculture. Warming, drought and extreme weather are already altering yields and quality of crops produced around the world. They also stand to impact water availability, nutritional value of foods, and food security and as such the livelihoods of natural resource dependent communities as a whole.

The economic effects are already being felt by farmers and across global supply chains. Agricultural businesses identify climate change as a serious long-term risk in supply management.

At the same time, agricultural land use systems all contribute to greenhouse gas (GHGs) emissions. Chemical fertilizers, manure and methane from livestock, wastewater and deforestation (converting forests to croplands or grazing lands) are all major emitters of GHGs. Globally, direct agricultural practices generate 10-12% of GHGs. Add to that deforestation, and agriculture accounts for 25% of global GHG emissions.
But agriculture and cattle production can also be a force for greater adaptation and resilience in the face of climate change. Under the right conditions, agriculture provides a multitude of environmental services, such as carbon sequestration, watershed protection and biodiversity conservation, all of which contribute to climate resilience. Certain sustainable practices help farmers under pressure from climate change to adapt and keep producing and improving without resorting to harmful techniques, and help companies manage and reduce climate risks in their supply chains.

"Climate-smart agriculture" is an approach to reorienting agricultural and cattle production to the new realities of climate change. It creates the technical, policy and investment conditions for achieving sustainable agricultural development and food security as climate change unfolds. It is composed of three main pillars:

- sustainably increasing agricultural productivity and incomes;
- adapting and building resilience to climate change; and
- reducing and/or removing GHG emissions where possible.

Climate smart agriculture is not a defined set of practices or an entirely new type of agriculture. Rather it is an approach that combines different methods under a climate change umbrella. It assesses the risks and needs of a specific farm or farming community through a climate impact lens, then addresses them using practices chosen for that particular situation. It gives farmers tools and a pathway to make their operations and livelihoods more productive and resilient in the face of climate change, while also helping reduce their climate impacts.

Appropriate practices will vary according to region, ecosystem, climate, and crop. Some common examples of climate smart practices that can increase productivity and resilience include planting diverse crops, which spreads climate risk and diversifies income streams; composting and soil management techniques, which improve soil fertility; and water saving, harvesting, and retention systems, which improve water availability during times of drought.

Some examples of climate smart practices that can mitigate GHG emissions include using fertilizer more efficiently; reducing encroachment by farms or ranches into forested areas; and encouraging agroforestry systems and planting of native tree species, which are often more resistant to climate change and can help protect local biodiversity.

How SAN Responded To Climate Change Historically

Climate smart agriculture has only recently been explicitly named in the Sustainable Agriculture Network (SAN) Standard. But SAN certification historically promoted uptake of practices now considered climate smart. For example, certified farms have long been required to have shade trees, which buffer vulnerable crops from swings in temperature and rainfall, and to conserve natural ecosystems on farms.

In 2011 SAN published a supplemental Climate Module, to support farms and producer groups that wanted to go beyond the existing SAN Standard. The module was a voluntary add-on to the 2010 SAN Standard, and farms were only verified against it, not certified to a climate smart standard. Adherents to the Climate Module did more with regards to climate change adaptation and mitigation through activities to further conserve forests and soils, sequester carbon, and prepare for extreme weather events.

How the 2017 SAN Standard Addresses Climate Change

In the 2017 edition, the SAN Standard integrates climate goals and a climate smart agriculture approach into its basic principles. Instead of a standalone climate module, the whole SAN Standard is now inherently oriented towards climate smart agriculture with a focus on adaptation and resilience. No longer an add-on, the relevant climate smart aspects are now embedded in the standard itself.

The new standard explicitly recognizes and addresses growing challenges climate change is already posing for farmers. It promotes climate resilience and adaptation for farms and farming communities by protecting native ecosystems and biodiversity, avoiding deforestation, maintaining healthy soils, sustaining water resources, and guiding farmers to select and adopt climate smart planting materials and farming practices.

It also seeks to reduce farmers' climate impacts by reducing energy, chemical fertilizer and pesticide use, and methane emissions, ¬ while maintaining or enhancing carbon stocks in soils, forests, and other on-farm vegetation.
Compared to the 2010 SAN Standard, the 2017 standard addresses climate change more robustly and directly with new requirements for climate-adaptive farm planning and management. It has strengthened requirements for diversifying trees and plants on farms, including restoring native vegetation in riparian areas. The new standard also mandates integrated pest management (IPM) to reduce use of chemical pesticides.
All of these requirements hold benefits for climate adaptation and resilience. Climate smart goals cut across the first three main principles of the new standard, as follows.

Principle 1: Effective Planning and Management

The first principle of the 2017 SAN Standard is Effective Planning and Management, which, "supports better farm productivity and efficiency, reduced environmental impact, and increased capacity to adapt to climate change. Increased efficiency in the use of land, water, fertilizers, and pesticides also supports climate change adaptation and mitigation."

Farms certified under the 2017 SAN Standard will conduct ongoing vulnerability assessments of how climate change can affect their operations and come up with action plans to address climate threats. This means exploring potential climatic changes and weather events and their potential impacts, farm by farm.

Climate conditions and impacts are highly variable depending on the region, the farm, and the crop. So are the quality of prior climate vulnerability assessments and the availability of information which determine the accuracy of new assessments. In Latin America, for example, where much information is already available, farmers and consultants are often far along the curve of understanding the local implications of climate change for a given crop.

But in other regions, where information is less available and previous assessments are less detailed, the new SAN Standard encourages famers to invest time and resources in assessments to gain a better understanding of what might happen as the local climate changes, and how they might plan for it.

Principle 2: Biodiversity Conservation

The second principle of the SAN Standard, Biodiversity Conservation, "contributes to the protection of biodiversity, natural ecosystems and their conservation values on and around certified farms."

Growing shade-tolerant crops such as coffee and cocoa under native shade trees helps maintain biodiversity and wildlife corridors. It also helps reduce evapotranspiration during periods of intense sun or drought, making farms more climate resilient. Farms that follow the SAN Standard restore native trees and other native vegetation, which supports ecosystem services such as natural pest control, helping to reduce pesticide use, which has positive climate adaptation and mitigation benefits.

Agriculture is the main driver of deforestation in the tropics, and is a significant cause of climate change. But to become certified under the SAN standard, farms cannot have engaged in conversion of forests (or any other terrestrial ecosystem) for at least five years. This requirement helps farms protect biodiversity, keep their forests standing, and their GHG emissions down. "By protecting biodiversity, natural ecosystems, and their stocks of carbon," the 2017 standard states, "certified farms apply key principles of climate smart agriculture and contribute to climate change adaptation and mitigation."

Principle 3: Natural Resource Conservation

The third principle of the 2017 SAN Standard, Natural Resource Conservation, requires farms to conserve resources by maintaining or improving soil health, reducing pesticide use, fertilizer runoff and environmental pollution, reducing, re-using, and recycling their waste, increasing their energy efficiency, and reducing the proportion of fossil fuels in their energy mix.

This principle stresses integrated pest management (IPM) to minimize chemical pesticide use. Reducing chemical pesticide use also lowers GHG emissions. "Improvements in soil organic matter, soil health, and water and pest management increase farm resilience to climate change." Meanwhile, reducing fossil fuel and chemical use and improving energy and waste management cut farms' GHG emissions.

Since crops can be more susceptible to pests during periods of extreme heat or drought, climate change can also bring new pests or make existing ones more virulent. Keeping chemical pesticide use as low as possible ensures maximum impact when chemicals do have to be used, because it minimizes previous exposure and keeps chemical resistance from building up. Using chemical pesticide as a last resort preserves their efficacy, and can enhance a farm's climate resilience.

Climate change and smallholders

Smallholder and indigenous communities whose livelihoods depend on farming and the health of the environment are especially vulnerable to the effects of climate change. Climate-related pest outbreaks, extreme weather events, droughts and altered growing seasons are already destabilizing many farms and communities. In particular, subsistence farmers in the tropics are on the front lines of climate change, with little access to resources to help cushion the disruptions climate change can cause in their operations and within their daily lives.

Climate smart agriculture increases the resilience of smallholder production systems and enhances their productivity, strengthening their livelihoods and their ability to work through and adapt to climate disruptions. This in turn decreases the pressure on farmers to convert more forests or other ecosystems to cropland to offset climate-related losses in production.

The 2017 SAN Standard provides a useful framework for smallholders, showing the importance of conducting assessments to identify the main risks and plan for the most appropriate climate smart practices that fit their circumstances. Group administrators play a key role in helping smallholders with the planning process, and local guidance materials support technical assistance to enable smallholder uptake of best practices for their region and crops. For example, where drought and longer periods of heat are identified as the main risks, as they often are for smallholder cocoa farmers in Ghana, a climate smart approach would focus on enhancing soil moisture, reducing solar radiation, and creating better microclimates. In places where the risks are heavy rain and flooding, which ruined an indigenous community's harvest during a tumultuous rainy season in Peru in 2014, a climate smart approach may focus on trenching, planting cover crops, and erosion management to enhance favorable soil properties.

Identifying and implementing such approaches can help individual smallholder farms and farming communities survive and thrive despite climate disruptions. Multiplied over many producers, this can also have significant regional benefits at the landscape level.

Promoting Healthier Landscapes

The benefits of climate smart agriculture don't stop at the farm gate. When many producers adopt climate smart practices across a landscape or supply chain, it can have meaningful benefits on a regional scale. For example, planning for climate impacts and adapting harvesting techniques helps safeguard livelihoods, not only for individual farmers, but across the wider economy.

The SAN Standard incorporates training and technical assistance to help farmers identify priorities beyond the scale of the individual farm, such as restoring surrounding ecosystems and addressing climate risks. Many SAN criteria focus on elements of the broader landscape, including conserving biodiversity, surrounding forests, watersheds and other natural ecosystems.

The landscape approach involves many stakeholders besides farmers, and requires cooperation at many levels between farmers' organizations, forest users, the private sector, national and subnational government, scientists, civil society, and local communities. But a climate smart agriculture approach can make important contributions to healthier, more resilient landscapes and livelihoods.

There is qualitative evidence that climate smart agriculture helps individual farms achieve greater climate adaptation and resilience. It helps reduce agriculture's negative climate impacts and boost positive ones, protecting surrounding forests and ecosystems, and promoting healthier, more resilient landscapes, which in the aggregate contributes to climate change mitigation.