

Intercropping coffee plants with shade trees is a sustainable way for farmers to continue coffee cultivation in the face of the threats posed by climate change.

Coffee in the shade

Climate change is predicted to have a strongly detrimental impact on coffee production. (Photo: Atstock Productions/Shutterstock)

COFFEE IS A major cash crop in sub-Saharan Africa, forming the backbone of economies in countries like Uganda, Ethiopia and Ghana. With climate change, coffee cultivation patterns across the world are changing, posing serious threats to production and farmer livelihoods.

Studies predict that the regions suitable for coffee cultivation will shrink as a result of rise in temperatures and precipitation patterns shift. A recent report published by the Climate Institute, a non-profit organisation in Australia, revealed that climate change will reduce the global area suitable for coffee by about 50 per cent, apart from exacerbating the threat of diseases like coffee rust and pests like the coffee berry borer.

In Uganda, for instance, areas suitable for coffee production are projected to reduce and it is predicted that if farmers do not take measures to adapt to climate change, 3.5 million Ugandans directly involved in the coffee value chain will lose their livelihoods and foreign export earnings from coffee exports, which was equivalent to US\$415mn in 2015/2016, will be seriously impacted.

There are many ongoing projects to develop low-cost and multipurpose solutions that can help coffee growers across the world adapt to climate change. In many coffee-growing regions, farmers are trying to adapt by planting at higher and cooler altitudes.

When done right, shade trees not only help farmers continue to grow coffee but also yield enhancements like food, timber, among others.

Intercropping

In regions where mountainous terrain is not available, farmers are turning to agroforestry, a practice of intercropping coffee plants with trees. The shade provided by the trees helps reduce the ambient temperature of the coffee plants. When done right, shade trees not only help farmers continue to grow coffee but also yield enhancements like food and timber.

While the benefits of shade trees are many, they also pose a set of challenges. Shade trees often compete with coffee plants for nutrients and prevent optimum amount of sunlight from reaching the plants. Some shade trees also increase the incidences of pests and diseases in certain conditions.

Choosing which shade trees to grow is, therefore, crucial. The considerations that influence the choice of shade trees involve both the other environmental services the shade tree needs to provide, and whether or not that specific species will not cause more harm than good.

Shade Tree Advice tool

The International Institute for Tropical Agriculture (IITA) and partners in Uganda and Ghana have developed a Shade Tree Advice Tool that can help farmers choose which trees to plant that fit their specific needs. The Shade Tree Advice tool consolidates both scientific and farmer knowledge to help farmers identify trees that fit closely to their specific needs and to help them choose the trees to plant.

The pilot study that developed the first prototype of the Shade Tree Advice tool was conducted in Mt Elgon in eastern Uganda, where the effects of increasing temperature are worse than higher up the mountain. The first step in building a database of shade trees in the region was an on-farm inventory of the shade trees present on 50 farms in the low, middle and high altitude zones, respectively. The second step was to survey 100 farms in each altitude, in which farmers first ranked various tree-based environmental services by preference, and then ranked shade trees in their ability to provide these environmental services. The database therefore was built based on local use and knowledge of shade trees, and can therefore help farmers at specific altitudes choose the right shade tree.

A prototype of the Shade Tree Advice Tool has been built and is currently available as a website. It can be found at www.shadetreeadvice.org. The database is