



How to Protect Our Cocoa from Climate Change?

A brief from the Integrated Climate Change Adaptation Strategies (ICCAS) Programme



Challenge

In recent years the cocoa industry has come across new challenges due to climate change. Heavy rainfall events lead into runoff as opposed to water that is retained within the soil. More intense tropical storms that can interrupt production. The experiences from hurricanes Ivan and Emily showed that cocoa trees are very resistant to tropical storms, but the trees that provided shade to the cocoa trees fell during the storms. Increase in weeds, particularly in the rainy season which is a major problem for some farmers, especially the ones who do not mulch. Increased temperatures and prolonged dry seasons have created heat stress for the trees and can ultimately lead to the death of the trees. The areas in the lower belts have become too hot and the pests (i.e. the cocoa beetles) prefer these hotter areas. Heat-stressed trees are more vulnerable to pest infestation. There is also an increase in diseases (i.e. Black-pod) especially in areas along the river banks such as Balthazar because of the increase in condensation and humidity linked to warmer temperatures.

These negative impacts of climate change require the cocoa farmer to adapt and use climate-smart agricultural practices. On the other hand, one of the positive impacts of climate change is that cocoa production traditionally occurred from October to May but now, it bears from November to September, therefore resulting in a longer productive season.

How to deal with intense rainfall events and tropical storms?

Soil and water management:

- Contour drains across the slope
- Mulch the lands to cushion the soil from impact of the heavy rains

- Use organic fertilizers such as compost and a combination of chicken manure and seaweed. The organic matter in the fertilizer adds to the organic matter in the soil making it more resistant to erosion.



Leaves and shells left on the ground provide natural mulch

Integrated Agro-forestry:

- Use Overhead shade trees such as immortelle. An added benefit is that the fallen flowers of the trees serve as mulch.
- Although the cocoa trees are resistant to tropical storm because of their deep-rooted system, it is important that the farm should be cleared of the fallen shade trees immediately after the storm to reduce any potential negative impact that can result from rotting fallen trees on the farm. In such an event, after the storm, the cocoa trees become more vulnerable to other factors since they are exposed.
- Use vegetative barriers such as Angelica hedge along the banks of the drains and at the bottom of the drains use citrus trees. The citrus trees also grow taller than the cocoa.

- Along the boundaries of the farm plant soursop at 12ft apart as a windbreak.



Intercropping banana trees for shade, windbreak and mulch

How to deal with increasing temperature?

- It is no longer advisable for farmers to produce cocoa in the lower regions, therefore cocoa farms in these areas should be substituted with soursop. For those farmers who continue cocoa farming in those areas, it is advised to use dense windbreaks, shade trees and drip irrigation. The drip irrigation can be achieved by

tying a bottle of water with a hole around the tree, close to the roots

- The middle belt areas around the island continue to be very productive for cocoa trees such as Pointzfield, Mt. Rose, Hermitage, Malmont, Pomme Rose, Carrier, Balthazaar and Mirabeau.
- Use disease resistant varieties of cocoa such as Imperial College Selection (ICS) clones. Farmers can under-plant resistant varieties with the older established trees. The older trees will also provide shade to the under-planted younger plants.

How to deal with less annual rainfall?

- Harvest rain water, for instance by placing containers or drums in strategic locations on the cocoa farm to capture rainwater.

How to deal with prolonged dry season?

- Mulch with banana stalk especially since there may be water retained within.
- Mulch with the cocoa leaves (don't remove the fallen leaves from the ground).
- Mulch before the dry season

Case Study: Climate-Smart Agriculture in practice: The Grenada Organic Cocoa Farmers' Cooperative Society

Organic cocoa plantations are established in association with bananas to provide shade. The bananas are retained as a component of the mature plantation, alongside other fruit and shade-producing species. Leaves and flowers that drop from shade trees as well as undergrowth that is cleared at the end of the dry season and left in situ act as a mulch. Because it is a permanent plantation, organic cocoa captures carbon and is relatively resistant to drought. Cocoa is a deep-rooted species that is resilient to tropical storms. The organic mulches help prevent soil erosion and retain soil moisture. The fruit trees provide a diversity of produce over the course of the year, including export crops, such as cashew nut, cinnamon, golden apple, and soursop. Thus organic cocoa is an integrated, climate-smart farm system that provides benefits related to production, adaptation, and mitigation.

Organic cocoa production also has benefits for the wider economy and helps raise awareness of climate change issues. The Grenada Organic Cocoa Farmers Cooperative Society consists of about 12 farmers who have received organic certification through the German company Ceres. They have formed a strategic partnership with the Grenada Chocolate Company, using local labor to make premium quality dark organic chocolate for export and to supply the tourism industry. Cocoa production and processing facilities are themselves a tourist attraction and are becoming part of the wider agro-tourism experience offered on some Grenadian estates.

Some climate resilient practices to encourage organic cocoa farming:

- **Adaptation:** Deep rooted cocoa plants + shade trees + organic mulch provides resistance to drought, heavy rain and hurricanes
- **Mitigation:** Carbon capture through increased tree cover and soil conservation
- **Productivity:** Certified organic cocoa is a quality export product with link to processing (chocolate production); diversity of fruit species increases economic security.

Source: World Bank; CIAT; CATIE. 2014. Climate-Smart Agriculture in Grenada. CSA Country Profiles for Latin America Series. Washington, D.C.: The World Bank Group.

Government of Grenada

Merina Jessamy, Permanent Secretary
Ministry of Climate Resilience, the Environment,
Forestry, Fisheries, Disaster Management and
Information
Tel: +1-473-440-2078
Email: merinaedwards@hotmail.com

Ministry of Agriculture and Lands

Elvis Morain, Permanent Secretary (acting)
Tel: +1-473-440-2708



GIZ

Dieter Rothenberger, Head of GIZ/ICCAS
GIZ Office, Ministry of Climate Resilience,
the Environment, Forestry, Fisheries,
Disaster Management and Information
Tel: + 1-473-534-8000
Email: dieter.rothenberger@giz.de