

Climate Resilience of Smallholder Cotton Farmers

Implemented by the *Fund for the Promotion of Innovation in Agriculture (i4Ag)*
As part of the special initiative *Transformation of Agricultural and Food Systems*

The Challenge

Smallholder cotton farmers are confronted with climate change, degraded soils, expensive inputs and low, stagnant yields

About 95 per cent of African cotton farms are rainfed, rendering smallholder farmers extremely vulnerable to the increasing effects of climate change. Shifts in rainfall and warming, with greater severity of degraded soils as a result of low water-holding capacity and high evapotranspiration losses, negatively affect the already low and stagnant lint yields in countries like Cameroon. These degraded soils, with low fertility and low soil organic carbon content, require synthetic fertilizers, yet such fertilizers are unaffordable for many smallholder cotton farmers in Africa and can harm the environment. At the same time, the indiscriminate use of insecticides and mixtures leads to a loss of biodiversity, long-term increased pestilence, and disruption of natural biocontrol. While innovative approaches to strengthen climate resilience in smallholder cotton farming already exist in countries such as China and India, there is a lack of availability of the appropriate technologies in Cameroon.

Name of the Project	Innovations to strengthen climate resilience in smallholder cotton farming
Name of the Global Fund	Fund for the Promotion of Innovation in Agriculture (i4Ag)
Commissioned by	Federal Ministry for Economic Cooperation and Development (BMZ)
Project Region	Cameroon
Implementing Partners	International Cotton Advisory Committee (ICAC), Centre de coopération internationale en recherche agronomique pour le développement (CIRAD), Institut de Recherche Agricole pour le Développement (IRAD), Société de développement du coton (SODECOTON)
Duration	10/2022 — 04/2026

The Innovation

Validate, adapt and disseminate three innovations to improve climate resilience and increase income

The project aims to adapt and establish three scientific innovations in smallholder farms across Cameroon that have been successful in other locations. These innovations are new agricultural inputs and practices that are sustainable and environmentally-friendly and have the potential to increase farmers' income substantially while fostering entrepreneurship. They include climate-resilient, non-genetically modified varieties adapted to innovative high-density cropping systems, the use of biochar fortified with agricultural biowaste (manure, biofertilizer and legume biomass) and the use of botanical biopesticides encapsulated in zein (a protein extracted from maize) nanoparticles.

The Main Objective

Strengthening the climate resilience of smallholder cotton farmers through sustainable innovations



Harvested cotton in Subsaharan Africa

33,750 trained smallholders confirmed that they will apply innovative inputs and practices to strengthen climate resilience in cotton farming

50 young entrepreneurs have generated additional income

40 % increase in yields for 3,000 smallholder farmers

15 % increase in soil organic carbon content

The project contributes to the achievement of these Sustainable Development Goals (SDGs):



Methodological Approach and Innovation Partnership

Extension workers, lead farmers, women and youth are trained to apply the described practices as well as in the production of innovative agricultural inputs and in knowledge transfer using interactive digital approaches. A network will further be established between lead farmers with a role model function and smallholder cotton farmers, as well as between the smallholders themselves who participate in farmer field schools and learning forums. An exchange of information with experienced employees of local research institutes will be enabled for them. As a local innovation partner, IRAD will expand their research areas and, where appropriate, their curricula to include climate-resilient cotton production. The leading innovation partners, ICAC and CIRAD, will also foster an exchange with the respective governments to support the adoption of the innovations in government initiatives and planning. The private company SODECOTON will also be encouraged to incorporate the innovative agricultural inputs and practices into their future strategic approaches. SODECOTON will further contribute to the partnership by providing extension staff

as well as facilities and by participating in the on-farm trials and farmer-participatory trials coordinated and supervised by their field staff.

Important Activities

- Import and multiplication of varietal seeds
- Multilocation testing and upscaling of farmer participatory demonstrations
- Setting up production units for innovative agricultural inputs at local research institutes
- Conducting trainings for youth and women entrepreneurs on the production of biochar and biopesticides
- Conducting trainings for extension workers and lead farmers on innovative agricultural inputs and practices and the implementation of farmer field schools

Sustainability and Scaling Strategy

Interactive knowledge transfer and participatory exchange formats ensure that the added value awareness of innovative inputs and practices is raised and that they continue to be applied beyond the duration of the project. The production of innovative agricultural inputs from local resources and with local capacities also increases the sustainable effectiveness of the measure.

Capacity building at the individual level for the extension workers and at the institutional level, e.g., at the research institute, ensures that the knowledge and competences built up are anchored in the region. Through the cooperation with cotton companies like SODECOTON, the project results are finding their way into the private sector as well. The exchange with the partner government also offers the opportunity to improve framework conditions for cotton farming and to exchange knowledge and experiences within the sector.

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