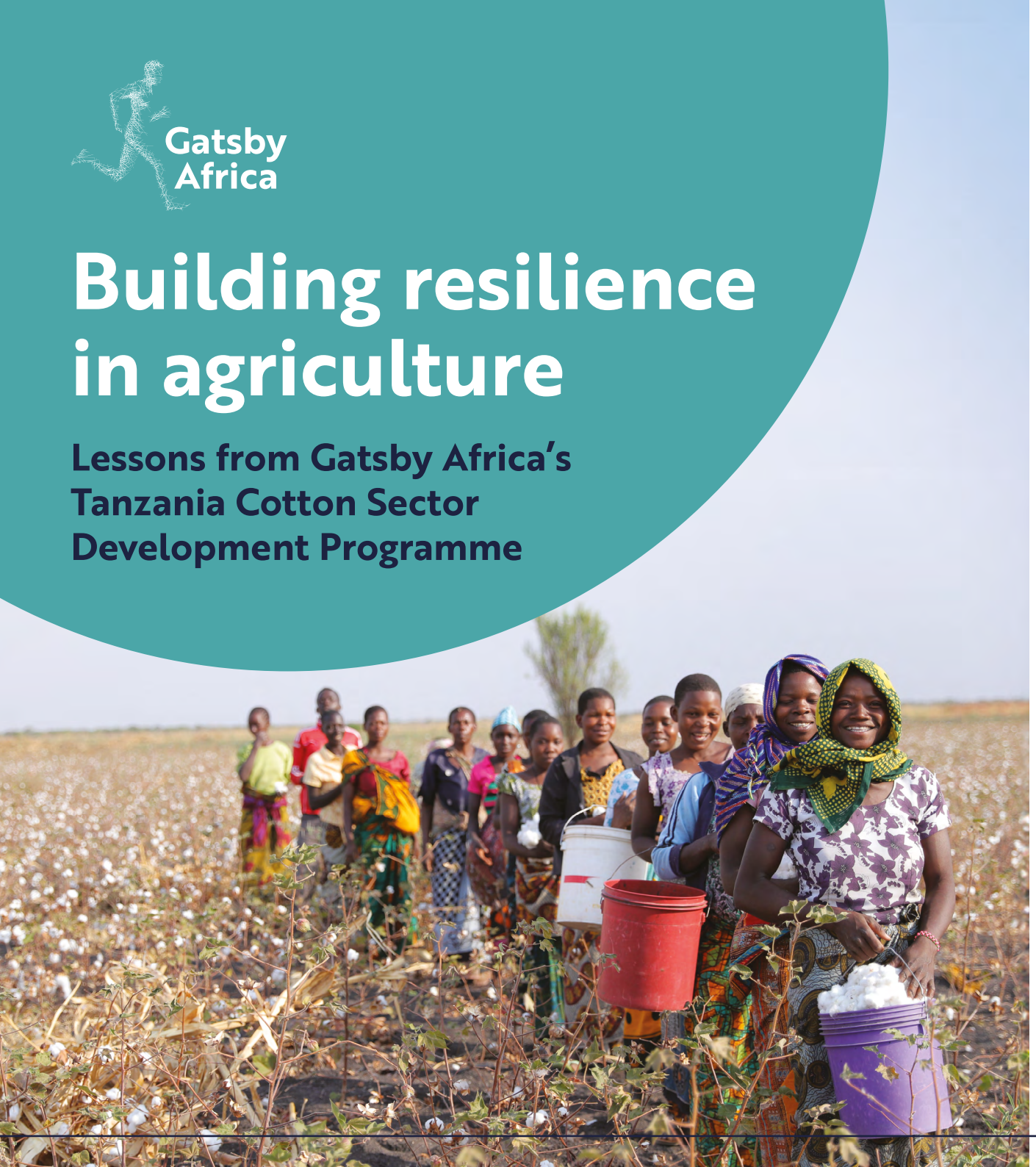
Gatsby Africa

Building resilience in agriculture

Lessons from Gatsby Africa's Tanzania Cotton Sector Development Programme



Context

There is huge momentum around the diverse regenerative agriculture movement, as a means of building agricultural resilience to shocks including climate change and other trends such as soil degradation and declining biodiversity. Gatsby has been working on these issues since 2009 in Tanzania's Lake Zone, through what we called conservation agriculture alongside last mile distribution.

Gatsby's work promoted the sustainable intensification of agriculture, aiming to tackle both resilience and low yields in a systemic way. We believe strongly that a dual focus is needed as yields, particularly for smaller growers across East Africa, remain well below potential due to a lack of investment in inputs and services, leading to low incomes. Equally, environmental, food and nutritional security outcomes remain challenging. The World Bank (2021) estimates that countries in East Africa experience moderate drought events on average every three to four years and major droughts every ten years. Climate forecasts indicate that as well as increased variability in rainfall, by 2030 to 2040 the short rains will deliver more rain than the long rains across East Africa.

We recognize the need for evidence-based agricultural practices that promote resilience and productivity whilst being tailored to the needs of the farmer given their context, capabilities and farming system.

Tanzanian programme

Tanzanian cotton yields are among the lowest in the world, at around half of those in West Africa. Among the many contributing factors are Tanzania's soils, which are generally deficient in phosphorus and nitrogen and typically have low organic matter in the drier cotton growing areas.

Conservation Agriculture (CA) was identified as a potential intervention to reduce soil erosion, control weeds and ultimately enhance yields in Tanzania's Lake Zone, the primary cotton-growing area (targeting over 500,000 households). This programme focused on cotton growing areas but worked across the basket of crops being planted. The key tenets of conservation agriculture can tackle both soil erosion and weed growth:

- Dry season land preparation
- Minimal soil disturbance with reduced or zero tillage, direct planting and use of ridges
- Crop rotation through crop sequences to manage diseases, pests and support nitrogen fixation
- Crop cover (e.g. mulching) and the appropriate use of herbicides reducing weed germination
- Mineral and organic fertiliser application – critical for nutrient replenishment.

Outcomes

Between 2010/11 and 2014/15 Gatsby supported ~5,000 Lead Farmers to deliver training in CA across all districts in the Lake Zone, including through demo plots. As a result of employing some CA practices, by 2015 21% of farmers surveyed saw higher yields. Of farmers surveyed in an ex-post evaluation in 2023 in areas with ongoing CA promotion, 26% were practising CA in any crop, and 9% were practising CA in cotton (practising in this case means at least 3 of the 5 practices). All such farmers were producing conventional (non-organic) cotton. They reported being motivated by higher yields and lower costs. Farmers that had adopted at least three core CA practices attained average yields of 527kg per acre, compared to 311 kg per acre for other farmers not using CA practices (358 kg per acre for organic), and earned USD 157 in average profits compared to USD92 per acre for others not using CA practices (USD 120 per acre for organic). It is, however, important to note that like elsewhere in sub-Saharan Africa, there was low adoption of some of the core practices of CA.

By enabling the most entrepreneurial lead farmers to become village-based agents and by training potential spray-service and tractor ripping entrepreneurs in conservation agriculture, Gatsby created a stronger local market for inputs (~800 shops) and services provision (~540 providers) alongside advice over a period of 5-6 years. This programme helped to raise yields and increase the sustainability of production and quality of soils. However, given a lack of structural changes in the cotton sector, the level of investment in farming to transform yields and livelihoods across the Lake Zone did not materialise. Sustainable intensification was only partial at best.

View the **full case study** for further insights!