



# TRANSFERRING FARMING TECHNOLOGIES

AUGUST 2014

Global agricultural productivity increased greatly in the last three decades of the 20<sup>th</sup> century, driven by new technologies including improved varieties, innovative crop management systems and superior post-harvest processing techniques. However, sub-Saharan Africa was left behind, partly because smallholder farmers could not access such technologies.



- In 2002 Gatsby partnered with the Rockefeller Foundation to finance the Maendeleo Agricultural Technology Fund (MATF) – a challenge fund that provided competitive grants for projects to transfer improved technologies to smallholder farmers in East Africa
- Managed by FARM-Africa, between 2002 and 2011 MATF funded 56 projects (plus 11 extensions) across East Africa, benefitting more than 150,000 households
- For every dollar invested in MATF projects, the return in terms of increased farmer income ranged from US\$1.3 to US\$24

## BACKGROUND

Institutional failures, market constraints and the limited transfer and adoption of improved technologies by smallholders caused agricultural productivity and growth to stall in sub-Saharan Africa for many years. This low productivity caused rural incomes to stagnate, fuelling a vicious cycle of poverty and food insecurity.

To escape this cycle, smallholders needed better access to the technologies driving productivity and income increases in the rest of the world. Moreover, they needed projects that would address the additional constraints that had prevented previous technology transfer efforts from fulfilling their potential, including bottlenecks in the marketing chain, poor access to information, limited relevant training, and a lack of access to financial services to buy necessary inputs.

## MATF

In 2002 Gatsby and the Rockefeller Foundation established the Maendeleo Agricultural Technology Fund (MATF) to support smallholders in East Africa to improve their production through access to new technologies, training and links to markets. Through a challenge fund mechanism, MATF aimed to disseminate innovative and proven agricultural technologies, facilitate effective partnerships, and identify and promote successful dissemination methods.

MATF looked to finance projects that would bring together partners with complementary expertise and resources to work with groups of farmers. These partners would include at least one with access to technology and one or more to address the additional constraints to successful uptake faced by farmers.

## OPERATION

---

MATF was managed by FARM (Food & Agricultural Research Management)-Africa – an international charity founded in Kenya in 1985 to reduce poverty in East and South Africa by enabling smallholders to develop effective approaches to natural resource management.

Between 2002 and 2011 MATF made grants ranging from £30,000 to £90,000 to develop 56 technology transfer projects across Kenya, Tanzania and Uganda. It gave a further 11 grants to extend particularly successful projects.

Initial rounds of funding concentrated on production. Rounds Three and Four focused on value addition and processing, and the final round centred on the need to develop links to markets. In all, MATF received more than 1,700 concept notes for projects.

The fund supported various technologies and approaches. Some technologies were relatively simple – for example the replacement of a traditional bean variety with a new disease-resistant one. Others were more complex, including a technique for ensuring a whole batch of poultry chicks hatch on the same day.

## IMPACT

---

With Gatsby support, more than 150,000 households benefitted from the adoption of improved technologies transferred by MATF projects.

An external evaluation found wide variation in the projects' impact on productivity and incomes, but showed that for every dollar invested in MATF projects, the return in terms of increased farmer income ranged from US\$1.3 to US\$24.

Examples of project impacts include:

- A tissue culture banana project in Uganda which raised the weight of a bunch from an average of 20kg to over 60kg for 4,000 farmers;
- A project in Uganda which disseminated disease-resistance cassava varieties, raising yields ninefold for 5,000 farmers, and enabling three farmers' groups to purchase a processing factory;

- A project in Tanzania and Kenya that promoted African indigenous vegetables to women farmers and improved market access, tripling the area under cultivation and increasing gross margins by 1,550% – from US\$303 per quarter acre with conventional vegetables to US\$5,013 per quarter acre with indigenous vegetables.

## SCALING UP

---

The success of several projects saw others fund their scaling. For example, the cassava project in Uganda leveraged over £260,000 in funding from the National Farmers' Union of Great Britain to extend to western Kenya, while a coffee project from Round Three contributed to the success of Technoserve's wider work in the crop, leveraging a US\$47 million four-year grant from the Bill & Melinda Gates Foundation to scale up the outcomes in Tanzania, Kenya and Rwanda.

## LESSONS

---

New technologies can increase agricultural production and improve the livelihoods of smallholders in East Africa. But technology alone is not enough.

The technologies that are promoted must be appropriate and have the confidence of smallholders. This is most often the case when farmers have been involved in developing, testing and adapting them.

Moreover, farmer involvement is critical for effective promotion and dissemination of technologies. Successful methods included farmer field schools; farmer visits and exchanges; and the training of trainers from among farmers in the community. Such methods ensured communities were not reliant on external expertise, enhancing the sustainability of projects.

Building input supply and market linkages to support the technology was also important for long term sustainability and future expansion. When a project is a technological success, leading to a sudden increase in the production of a commodity, there is a danger prices will fall if the market cannot absorb the increase. Similar supply issues can see input prices rise beyond farmers' reach. Projects that focus on getting the technology right without

building secure links to input and output markets are likely to bring disappointment and frustration, and a market assessment is a critical part of project design.

MATF projects tackled these issues in various ways, including by giving training in business skills and marketing, forming co-operatives to strengthen negotiating positions, forging links with partners with access to distant markets, negotiating contracts with processors, and setting up processing centres.

A particularly successful method of ensuring benefits continued beyond the initial projects was working with local government departments to bring support for the technology within the scope of regular extension and advisory services.

## BUILDING ON SUCCESS

---

FARM-Africa is now building on MATF through the Maendeleo Agricultural Enterprise Fund (MAEF). MAEF aims to benefit approximately 100,000 farmers directly, enabling them to move beyond subsistence production and build sustainable enterprises.

MAEF is awarding grants of up to £80,000 for three years to initiatives that support smallholders to adopt appropriate new technologies that can: improve their traditional farming skills and increase their agricultural productivity; add value to their harvest through improved post-harvest handling and simple agro-processing techniques; and bring their produce to profitable markets to maximise their gains.

By 2015 MAEF aims to have helped more than 100,000 smallholders in Tanzania, Uganda, Kenya and Ethiopia to achieve food security, increase their household incomes by at least €360, and invest in value-added agricultural technologies and practices as entrepreneurs in a growing series of output markets.

---

The MATF showed the great impact that technology transfer can have on agricultural productivity and livelihoods in East Africa. However, it emphasised that to maximise gains projects must also encourage farmer participation, build secure links to reliable markets, and address sustainability. MAEF will build on these lessons to further increase impact.