Agricultural

Micro-irrigation for food security

Madagascar

water scarcity impact

Reduced withdrawal	●
Reduced consumption	
Improved water quality	
Increased productivity	●
Net basin benefit	

volumetric impact

641 500 m^3/yr

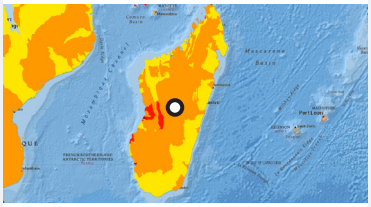
programme cost

$1 415 000

estimated unit cost of water

75 ¢/m^3

Water Stress
Madagascar



Arid & low water use
Low (<10%)
Low to med (10-20%)
Med to high (20-40%)
High (40-80%)
Extremely high (>80%)
No data available

Water Stress Map:
F. Gassert, P. Reig, T. Shiao, M. Luck and M. Landis, 2015. "Aqueduct Global Maps 2.1."

Confidence level
Low Medium High

Water Scarcity Impact Key
Main Minor

Credits
We would like to acknowledge Audrey Nepveu of the International Fund for Agriculture Development (IFAD) and Gauthier Ricordeau of Agronomes et Vétérinaires Sans Frontières (AVSF) in the preparation of this case study.

Project Overview

Water scarcity and low soil fertility negatively impact the productivity of smallholder farmers. Increasing population and the effects of climate change threaten productivity further still.

As part of their Corporate Social Responsibility strategy, COOPERNIC (a sourcing alliance of major European retailers) partnered with the International Fund for Agricultural Development (IFAD) to improve food security of smallholder farmers in India, Guatemala and Madagascar. Scaling-up of Micro Irrigation Systems (SCAMPIS) implemented between 2009-2012, and aimed to increase farm productivity to create surpluses for local consumption and markets. Agronomes et Vétérinaires Sans Frontières (AVSF) served as the implementation partner in Madagascar.

Through a focus on financial support mechanisms and supply-chain capacity building, the project engaged with 8 800 households in the adoption of Micro-Irrigation technology across five districts in Madagascar. Uptake of the Micro Irrigation Systems (MIS) led to a 41% increase in agricultural productivity and a 69% reduction in water abstraction.

Key Elements

- Micro-Irrigation technology consisting of three components: a treadle pump, 100 litre bag, and a set of micro irrigation tubes servicing an area of 50 m^2 or 100 m^2.
- MIS kits cost $100 for all three components.
- Initial subsidies of between 40-90% of the capital cost of MIS components were offered.
- Knowledge and experience was shared, capacity of farmers built and direct engagement and promotional activities undertaken in order to achieve a critical mass of demand.
- 708 demonstration plots were created to promote the technology.

Key Outcomes

- Total reduction in water withdrawal of 641 500 m^3 per annum across the programme amounting to 32 500 litres per 100 m^2 plot per annum.
- Increase in yield of 220 kg per 100 m^2 plot per annum.
- Farmers able to cultivate produce for an additional 4 weeks per cropping cycle due to lower volumes of water being required to successfully cultivate crops.
- Kits were installed by 8 800 households across five districts in Madagascar.
- A greater variety of crops are being produced, providing greater resilience to fluctuating prices of individual crops.
- Development of local markets to supply and maintain Micro-Irrigation System (MIS) kits.

Madagascar

Intervention Features

¬ Drip irrigation systems ¬ Stakeholder engagement ¬ Subsidies for the purchase of water saving appliances
¬ Education, technical training and capacity building

Project Levers

(1) Public-Private partnership

As part of a CSR initiative COOPERNIC engaged and funded IFAD to establish a livelihood security programme around helping subsistence farmers in the target countries to become small scale commercial farmers.

(2) Supply chain and market place creation

In order to ensure long term viability of the initiative the establishment of a MIS equipment value chain was essential. A network of local manufacturers and technicians resulted in improved dialogue and understanding of realities and problems faced in the field as well as reduced transportation distances and thus, costs.

(3) Location appropriate technology adaptation

MIS technology developed in India was adapted for Madagascar. The adaptation allowed for greater compatibility with sloping and irregular plots, an important factor for the Madagascar context.

(4) Reaching out to direct beneficiaries

The creation of demonstration plots, market demonstrations and exposure visits were essential in convincing farmers of the value in adopting MIS over their traditional farming practices.

(5) Influencing smallholders investment decisions

The provision of subsidies parallel to the support of supply chain development was crucial in the uptake of MIS. Subsidies were offered on the basis of household income. Credit-savings initiatives were subsequently introduced to maintain demand whilst initial subsidies were phased out during the course of the programme. The table below shows the rate at which subsidies were offered year on year.

Year	Subsidy Rate			
	Pumps	Kits 100 m^2 square	Kits 100 m^2 rectangular	MIS package
2010	56%	67%	-	57%
2011	47%	65%	63%	52%
2012	38%	65%	57%	43%

Outcomes and Challenges

Establishment of local supply chain was essential and included:

- One local manufacturer of pedal pumps with patented innovation.
- Two local manufacturers of MIS kits.
- 45 resellers.
- 69 technicians

Monitored data shows a reduction in withdrawal rates, however, given the increase in biomass produced, it is likely that water consumption has increased proportionally.

Engendering uptake of MIS kits in Madagascar was more challenging than in the other two country programmes. Two reasons were identified for this situation:

- Many vulnerable farmers could not afford to buy the kits.
- Malagasy farmers were highly traditional and relatively unwilling to stray from traditional methods.

Above: Example of an MIS system: treadle pump, 100 litre bag and micro irrigation tubes (© AVSF)