



Improving irrigation access in Madagascar

Agriculture accounts for 28.2 per cent of Madagascar's gross domestic product¹ and is the country's most common source of livelihood, employing more than 75 per cent of its rural population. Madagascar has an overall poverty rate of 76.5 per cent, with more than 50 per cent of the population affected by environmental and weather-related shocks. These environmental challenges are particularly acute in the Menabe and Melaky regions, where farmers are primarily dependent on rice production and related activities, and where rates of poverty and malnutrition are especially high.

In an effort to improve the lives of smallholder farmers in these regions, the International Fund for Agricultural Development funded the Appui au Développement du Menabe et du Melaky (AD2M) programme. The programme combined land titling with improved irrigation infrastructure to increase productivity levels and reduce farmers' susceptibility to weather and climate shocks. American Institutes for Research and LEAD Analytics used propensity score matching to measure the programme's impact and explore whether and how large-scale infrastructure projects could benefit smallholder farmers.

Highlights

- AD2M participants saw improved agricultural productivity, largely through being able to grow crops in more than one season.
- Productivity increases translated into greater income potential, with AD2M participants experiencing a 13.6 per cent increase in the value of crop production per capita.
- AD2M also improved participants' perceived food security, with programme recipients reporting less anxiety about having access to food.

Intervention

AD2M targeted 19 groups of villages across 5 districts in western Madagascar, ultimately reaching 57,000 households. The programme prioritised vulnerable farmers, especially those who were landless and who had few or no productive assets.

AD2M included land titling, irrigation, training and related rural development programmes. It supported local land offices in providing tenure security to smallholders, resulting in the issuance of nearly 9,000 land certificates. AD2M also extended irrigation facilities over 5,500 hectares of land, including 3,300 hectares of new irrigation and 2,200 hectares of rehabilitated infrastructure. AD2M farmers received training in ways to increase crop values, including improved seed varieties, better planting techniques and greater investment in growing cash crops.

Main findings

The evaluation results suggest that, overall, AD2M had a number of positive effects for programme participants:

- Farmers' production output increased by an estimated 25 per cent, corresponding to a 16 per cent increase in crop value. The evidence suggests that much of this gain is attributable to farmers' increased ability to raise crops during Madagascar's second growing season.
- Farmers had better access to water for crops, in terms of quantity and quality. They were 15 percentage points more likely to receive water on time and 26 percentage points more likely to regard the irrigation water as of good quality.
- The results suggest a positive impact on household welfare. Although the evaluation did not

collect quantitative data on incomes, qualitative data shows that participants reported greater household incomes, which they attributed to higher rice production levels. They also owned more durable goods than non-participants and had been less worried about food availability in the past week. There were no significant effects on household members' health.

- Analysis of qualitative data showed that some participants also highlighted a downside of the intervention, which was an increase in tension between farmers who cooperated with AD2M and those who did not. In addition, there was an apparent increase in mistrust of Water User Association members amongst non-members.



Recommendations for policy and programming

The evaluation provides several lessons that can inform the design and implementation of agricultural programmes, particularly those focusing on irrigation.

■ **Ensure the sustainability of irrigation infrastructure.** AD2M farmers emphasised the need for structures that are sustainable after the intervention ends. They advocated building permanent structures of durable materials that require minimal maintenance and upkeep by communities. Further, management of the irrigation systems should be systematic, with multiple community members trained on managing and maintaining the structures. These processes could help ensure that the benefits of irrigation investments endure beyond the end of a specific programme.

■ **Maintain communication and dialogue.**

Irrigation programmes may include activities that differ from traditional irrigation practices, which can make farmers wary. In AD2M, some farmers expressed doubts about the patterns of fields selected for flooding and drying. Thus, regular and open communication with farmers is crucial for promoting buy-in and uptake and for ensuring the programme is seen as equitable. An effective communication strategy covers how the irrigation infrastructure will be beneficial to all farmers and how water regulation will increase crop yields. It is essential to communicate with the farmers and address the concerns of those who are most affected by changes in the irrigation structure.

■ **Teach about climate change.**

Knowledge about future climate risk could encourage households to adopt better practices, especially regarding irrigation, line cultivation, fertilisers and crop rotation. Understanding how farmers in a community perceive and respond to risk is the key to framing these messages appropriately.

■ **Sustain financing and protection.** Even when farmers want to adopt the methods promoted by an agricultural programme, they may require ongoing support to implement the methods after the programme ends. Reliable microfinance systems can ensure ongoing access to high-quality seeds, fertilisers and new marketing techniques. Likewise, insurance systems can protect farmers from catastrophic losses due to environmental and other shocks.





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About this impact evaluation

This brief is based on an impact evaluation report published in 2018, *Impact evaluation of the Menabe and*

Melaky development programme in Madagascar, 3ie Impact Evaluation Report 74, by Hannah Ring, Mitchell

Morey, Erin Kavanagh, Kevin Kamto, Nancy McCarthy, Joshua Brubaker and Charles Rakotondrafara.

Endnotes

¹World Bank, 2012. World development indicators 2012 (English). Washington, DC: World Bank. Available at: <<http://documents.worldbank.org/curated/en/553131468163740875/World-development-indicators-2012>> [Accessed 30 October 2018].

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