Ethiopia

Participatory Small-Scale Irrigation Development Programme I (PASIDP I)[1]

About the project

Objective. The Participatory Small-Scale Irrigation Development Programme (PASIDP) was implemented to improve the food security, family nutrition, and income of poor rural households living in drought-prone and food-deficit areas in Amhara, Oromia, Tigray, and Southern Nations, Nationalities and Peoples Region (SNNPR) in Ethiopia through a sustainable farmer-owned and -managed system of small-scale irrigated agriculture.

Financing. PASIDP was co-funded by IFAD, the Government of Ethiopia, and contributions from beneficiary communities. The total cost of the project was US$57.7 million.

Timing. PASIDP constructed a total of 121 irrigation schemes between March 2008 and September 2015.

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[1] Results from a High-Frequency Data Collection

The project's theory of change

The project comprised three main components. First, the institutional component involved forming **water user associations (WUAs)** in each community participating in the project. The project's extension agents trained WUA leaders and members in how to efficiently and effectively manage and distribute water. **Capacity-building** activities and **skills training** were provided to the beneficiaries to increase their knowledge and awareness of agricultural technologies and improved practices.

The second component improved the **catchment area planning** of small-scale irrigation schemes. With a well-functioning irrigation system in place, project beneficiaries would obtain (1) a more constant supply of water, (2) a substantially higher supply of water overall, and (3) a timely water supply for agricultural production over the course of the cultivation seasons.

Third, the agricultural development component strengthened **agricultural support services**; **improved farming practices**, particularly in seed production systems, post-harvest management, watershed-based soil management and water conservation; and promoted **home gardens** for women.

The small-scale irrigation schemes, along with the other capacity-building and training activities, were expected to help beneficiaries increase household consumption, achieve higher and more stable incomes by increasing agricultural production, and improve their resilience to shocks by allowing them to better cope with and recover from negative shocks. These interventions may also allow beneficiaries at the bottom end of the income distribution to move out of poverty.

Farmers with access to irrigation are better able to grow crops throughout the year, giving them greater opportunities to earn income from crop sales than they would have if they relied mostly on water from rainfall. Furthermore, irrigation may also help beneficiaries reduce the need to adopt negative risk-coping strategies such as selling assets, reducing consumption, or migrating other areas in search of other wage opportunities.

The impact of irrigation development on beneficiaries depends, however, on their adoption of agricultural technologies and practices that are complementary to irrigation. The lack of adoption of such technologies and practices, which might be necessary to fully harness the potential of irrigation, could hinder the full potential impact of irrigation projects.

Project outreach and outputs

Determining the overall impact of the project requires first understanding whom the project reached and what outputs it generated.

Irrigation schemes constructed: **121**

Hectares of irrigated land covered: **12,000**

Beneficiary households: **62,000**

Total beneficiaries: **311,000**

WUAs established and strengthened: **175**

Women-headed households trained in home-garden development: **7,144**

Project impact

As part of IFAD's Development Effectiveness Framework, PASIDP I has been subject to a rigorous impact assessment. Complementing the study carried out during IFAD9, this study particularly aims to assess the sustainability of impacts and whether the interventions were able to enhance beneficiaries' resilience status during a protracted drought.

Data and methods

This study employed a special high-frequency data collection system in which granular data were collected across 4 seasons and over 12 months. This special data collection allowed researchers to assess the sustainability of impacts, as well as seasonality effects, on farmers' resilience, agricultural productivity and well-being. The assessment used a variety of non-experimental approaches, including a dynamic model, to estimate impact on well-being proxies and resilience over time.

	Productive assets	Grain **crop yields**	**Market participation** for crops	**Crop sales** revenue
Dry season	+22%	+51%	+175%	+213%
Short rainy season	+15%	+47%	+66%	+77%

Key impact estimates

With regard to economic mobility, beneficiary farmers experienced higher returns from productive assets during the dry season.

In terms of agricultural production, beneficiary farmers invested 57 per cent more in fertilizer in the short rainy season and obtained higher yields. As one would expect, the impacts were particularly evident in the dry season, when the benefits of irrigation should be felt the most.

Impacts were also apparent across the crop portfolio, where the value of sales of specific crops (notably grains and cereals, but also vegetables and fruit) was significantly higher for farmers who had access to modern irrigation than for their rain-fed counterparts. Beneficiaries exhibited a 55 per cent and 130 per cent increase in the value of their cereal crop produce, respectively, in the dry season and the short rainy season.

Another key finding was the reduction in negative coping strategies to which households resorted in times of distress. This reduction was particularly significant in the season immediately following the dry season, implying that beneficiary farmers increased their resilience status.

Market access also improved. Beneficiaries were 175 per cent more likely than their rain-fed counterparts to sell their crop produce to the market, particularly in the dry season and to a lesser extent in the following short rainy season.

The findings from the dynamic model corroborated the findings showing that the interventions increased beneficiary households' welfare despite the drought shock, contributing to their increased resilience. Asset growth was also found to be inversely related to initial assets, suggesting that asset growth was greater for those farmers who were asset-poor at the outset of the project. Results also showed that the project encouraged gains in resilience across the seasons and that these gains increased over time.

About the brief

This brief draws upon the findings of an impact assessment of PASIDP I in Ethiopia, which was prepared by Alessandra Garbero and Bezawit Beyene Chichaibelu.

The impact assessment report on PASIDP I is available upon request.

Lessons learned

- Overall this study clearly provides strong evidence that investing in irrigation is **transformative** for farmers, particularly for the poorest farmers, and generates returns that make farmers resilient to climatic shocks. To this end, irrigation may act as an effective **risk management strategy**, increasing farmers' income and building their resilience.
- Small-scale irrigation infrastructure is effective at increasing production of high-value crops but **must be bundled with marketing and market access interventions** to allow farmers to maximize the benefits from increased production. Commercialization and marketing support continue to be areas where improvement is needed and should be bundled with interventions aimed at improving agricultural production.
- A key finding is the **reduction in the negative coping strategies** to which households resort in times of distress. This reduction is particularly significant in the short rainy season, which immediately follows the dry season, illustrating the persistence of project impacts beyond the dry season.
- Measuring the impact of IFAD-supported project interventions on resilience requires adequate data. Projects that aim to enhance resilience and protect smallholders from climatic shocks need to have different data systems from conventional monitoring and evaluation approaches. Resilience data must be collected at a **high frequency** to capture the impacts of stressors and shocks (and responses to shocks) using shock-sensitive indicators. The data must be collected over the long term – ex ante rather than ex post – because vulnerability to shocks is the product of slower-moving stressors as well as of long-term, multisector interventions for building resilience. To minimize the costs of such a data collection, specific data should be collected at **sentinel sites** – small samples of sites that are strategically selected to monitor risk, shocks and welfare outcomes while maintaining the representativeness of key structural characteristics, such as specific agro-ecologies or livelihood zones. **Remotely sensed data** can be used to provide objective shock metrics on a more frequent basis.

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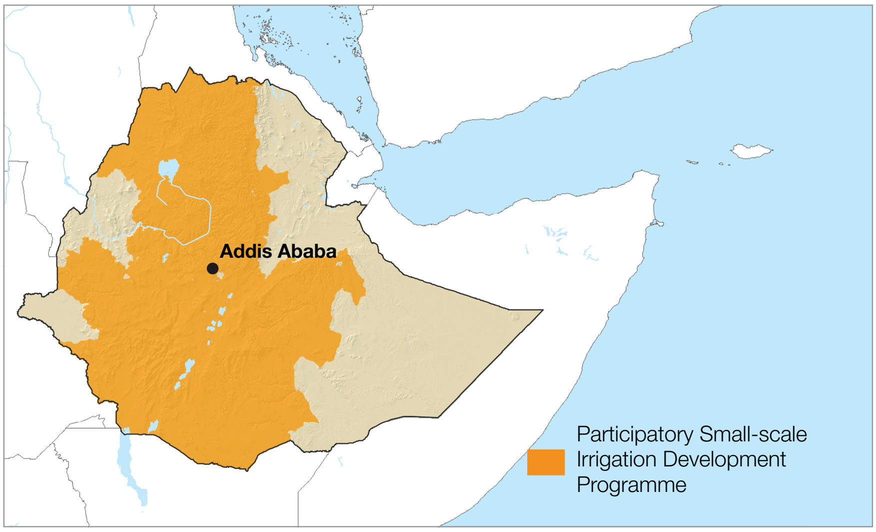

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March 2019