

Installation of micro-irrigation systems funded through a water credits system

Jalgaon Region, Maharashtra, India

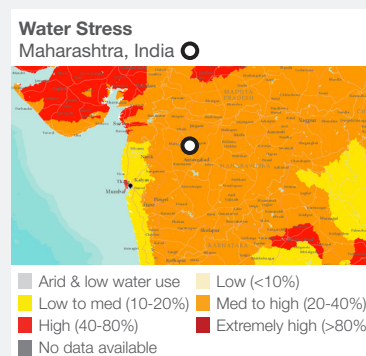
water scarcity impact

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

volumetric impact
181 000 m³/yr

programme cost
\$ 43 000

estimated unit cost of water
<5 ¢/m³



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 Brendan Smith of The Gold Standard Foundation and Astin Kumar Tyagi of Jain Irrigation Systems Ltd for their input in the preparation of this case study.

Project Overview

The project, led by Jain Irrigation Systems Limited (JISL), targeted smallholder onion producers from the North Maharashtra region assisting them to switch from traditional flood irrigation to micro-irrigation systems. This project resulted in reduced water withdrawals, improved productivity and increased income for the smallholder farmers.

The project was implemented in the Tapi River basin which has evaporation rates of up to 13 mm/day, one of the highest in the world. Groundwater is the primary source of irrigation in the area. The local aquifers have declined by over 4m since the 1980s due to increased withdrawals to supply significantly increased irrigated areas.

The dwindling water resources in the area puts financial pressure on smallholder farmers. Limited access to external funding and a general lack of awareness for better agricultural practices makes expansion and renovation challenging.

The project is part of The Gold Standard's Water Benefit Standard, which certifies water performance of projects, and issues verified outcomes in the form of Water Benefit Certificates. These can be bought by corporations, NGOs and governmental organisations and serve as a means of ongoing funding for the project.

Key Elements

- Adoption of micro-irrigation systems by 55 onion farms covering 50 hectares in place of conventional flood irrigation.
- Installation of on-farm monitoring to measure changes in water and fertiliser use.
- Utilising Gold Standard's Water Benefit Standard Certification scheme to finance and operate the scheme.
- Implementation of good agriculture practices and sustainable agriculture code, including on-farm health and safety training and agronomical support.
- Guaranteed minimum purchase price for produce from participating farms.

Key Outcomes

- Up to a 35% reduction in water withdrawals from 5 430 m³/ha per season to 3 620 m³/ha per season.
- 25% increase in crop yield in participating farms and 30% reduction in fertiliser usage.
- 30% increase in farmers' income.



Maharashtra, India

Intervention Features

- Drip irrigation systems
- Water benefit certification system
- Education, technical and capacity building

Project Levers

(1) Installation of micro-irrigation systems

The micro-irrigation systems enabled direct and controlled water and nutrient application to the root zone of the plants resulting in reduced withdrawal of water from the aquifer and improvement in fertiliser application rates and uptake by plants.

(2) Gold Standard's Water Benefit Certificates

Each certificate represents a specific volume of water that has been conserved, supplied, or purified during a defined period of time. They are issued annually after a rigorous external audit, and each farm must demonstrate reduction in water use not only at the farm level, but also at a watershed level. This approach ensures that the benefits of conversion to drip irrigation are shared by all users within the watershed.

Investors can purchase these certificates and the associated guaranteed water savings. This acts as a 'payment for performance' and generates revenues to sustain the project activities.

(3) Implementing Good Agricultural Practices (GAP)

The GAP include provision of ongoing technical and agronomical support to the farmers to ensure optimal operation and fertiliser application. JISL also provided training for the farmers on sustainable agricultural practices.

(4) Guaranteed minimum purchase price

The participating farmers are registered under JISL's contract farming system which provides farmers with high quality seeds and support throughout the crop growth cycle. The harvested produce is purchased by JISL at a minimum guaranteed price or the average of market price on the day of procurement, whichever is higher, providing income security for the farmers.

Outcomes and Challenges

Promoting the adoption of micro-irrigation systems remains the primary challenge of the programme, with the lack of technical knowledge, high initial capital cost, small land holdings and poor socio-economic status of farmers among the main factors preventing its broader use. More broadly, it is estimated that the current penetration rate in India is 3-4% of its potential for this technique.

Revenue from the Water Benefit Certificates has facilitated the introduction of affordable micro-irrigation. Working in conjunction with other initiatives, including a guaranteed price for onion production and better education opportunities, it is expected that this integrated approach will improve the welfare and prosperity of the farmers.

This intervention results in increased crop yield and an increased productivity per unit of water withdrawn. This is achieved through an increase in evapotranspiration and thus the overall impact on basin water scarcity may be negative. The balance between reduced withdrawal, increased evapotranspiration and reduced return flows needs to be monitored in order to determine the overall water scarcity impact of an intervention of this type.

It is envisaged that revenue from the Water Benefit Certificates will also be used to further expand the programme, reaching out to other producers of water intensive crops such as banana, sugarcane, rice and other orchard crops.



Above: Initial stage onion crop in drip irrigated field vs. flood irrigated field. (© JISL)