

# Smart Land & Water Use



“ Our agribusiness model is designed on the concept of 'resource to roots,' which not only addresses the water, energy, and food security, but especially helps smallholder farmers improve their incomes significantly.”

- ANIL JAIN, CHIEF EXECUTIVE OFFICER



## CORPORATE OVERVIEW: JAIN IRRIGATION SYSTEMS LIMITED



### Company Profile

Jain Irrigation Systems Limited is a business conglomerate with interests in micro-irrigation systems, food processing, PVC sheets and pipes, solar energy appliances, and non-banking financial services. Jain Farm Fresh Foods Limited is a subsidiary of Jain Irrigation Systems Limited.



### Revenue

Approximately \$1 billion (2016-2017)



### Operational Reach

Headquartered in Jalgaon, Maharashtra, India, the company has a business presence in over 120 countries.



### Relationship with IFC

Investment client since 2007 with cumulative investments of approximately \$150 million to date; advisory client since 2008

[www.jains.com](http://www.jains.com)

## PROGRAM OVERVIEW: WATER FOOTPRINT REDUCTION THROUGH DRIP IRRIGATION

Jain Irrigation Systems Limited (the "company") is one of the world's largest manufacturers of micro-irrigation systems (for example, drip sprinklers). Through its subsidiary Jain Farm Fresh Foods Limited, the company has business interests in food processing and has one of the largest industrial establishments in India for processing dehydrated produce, such as mangoes and onions.

### THE CHALLENGE

Vegetable and fruit farming in India is predominantly done by smallholders, especially women farmers. In large parts of the country, particularly South India, there are increasing water shortages due to erratic rains caused by climate change and unsustainable groundwater usage in order to meet agricultural, industrial, and domestic water demands. The limited availability of water constrains smallholders' ability to produce and supply buyers such as Jain Farm Fresh Foods Limited.

## INCREASING WATER STRESS PUTS PRESSURE ON SMALLHOLDERS, LIMITS YIELDS

**Growing demand for water requires innovative solutions.**

Source: IFC 2017

## THE SOLUTION

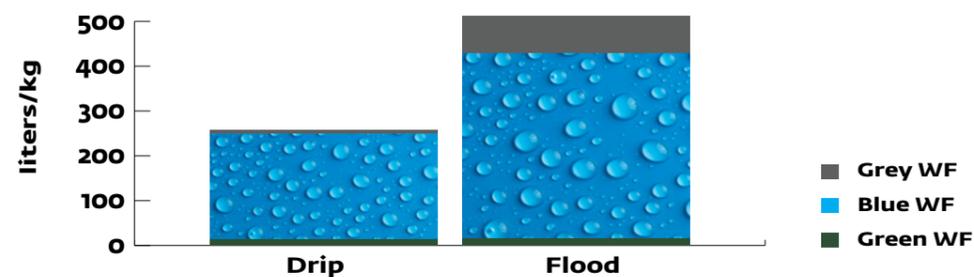
The company has worked tirelessly to promote its 'more crop per drop' vision of irrigation. Through a detailed study of the interrelationship between soil, water, crops, terrain, and related agro-climatic conditions, it has designed a viable system to deliver measured quantities of water at the roots of plants at regular intervals. This ensures that the plants do not suffer from under- or over-irrigation. The company ensures that farmers are able to manage its micro-irrigation systems and it provides requisite after-sale services.

In collaboration with IFC, the company initiated India's first corporate water interest in the agribusiness sector when they tested growing dehydrated onions with and without drip irrigation in the Tapi River basin in North Central Maharashtra.

Using drip irrigation in onion cultivation has resulted in 1,200 liters of water saved per kilogram of dehydrated onions per year compared with onion cultivation using conventional irrigation. Since the bulk of dehydrated onions are exported, there is a reduction in virtual water trade of another 18 million cubic meters annually.

The benefits of drip irrigation in reducing water usage are also visible in the onion supply chain (farm-level) as shown in the table below. Compared to flood irrigation, the blue water footprint of onion cultivation under drip irrigation is less than one-third (500 liters per kilogram) of dehydrated onions under drip versus 1,796 liters per kilogram without drip. The results are equally noticeable for the gray water footprint at 13 liters per kilogram of dehydrated onions versus 286 liters per kilogram without drip.

**FIGURE 10.1: 'MORE CROP PER DROP' IRRIGATION REDUCES WATER FOOTPRINT WHILE IMPROVING YIELDS**



**FIGURE 10.2: FARMERS COVERED UNDER MICRO-IRRIGATION**

Year	White Onion			Mango			Banana		
	No. of Farmers	Areas Covered (Acres)	Crop Yield	No. of Farmers	Areas Covered (Acres)	Crop Yield	No. of Farmers	Areas Covered (Acres)	Crop Yield
2013-2014	2,445	4,977	36,726	-	-	-	420	2,682	-
2014-2015	2,452	4,679	38,054	148	209	6,931	599	3,600	15,047
2015-2016	2,489	5,400	47,171	582	3,948	5,613	658	4,011	28,356
2016-2017	2,489	5,056	43,206	453	3,172	6,210	476	2,599	10,414
2017-2018 (Proposed)	5,200	10,000	-	453	3,172	-	500	2,700	-

## RESULTS

There have been other on-farm benefits as well from the use of micro-irrigation systems. For instance, the efficiency of fertilizer use has increased by 30 percent due to fertigation through drip irrigation systems. This has also had a positive bearing on crop yields, which in most cases have increased by over 50 to 100 percent when the crop was well-tended. Given the positive on-farm results from the use of micro-irrigation systems, the company has been able to convert 500,000 farmers, including 50,000 women farmers, to drip irrigation, making it the dominant player in the Indian micro-irrigation market.

Furthermore, while working with smallholders, the company realized that the cost of compliance with international supply chain standards such as GLOBALG.A.P. was very high. In collaboration with IFC, the company developed a simpler version of GLOBALG.A.P. referred to as Jain G.A.P. To implement Jain G.A.P., smallholders have been provided with assistance on soil water management to reduce input usage, technical agronomy extension support for cultivating improved varieties for higher yields, containers for safe storage of pesticides, first-aid kits on farms, personal protective equipment, requisite training for use of such equipment, and a manual for data keeping.

The company has mainstreamed Jain G.A.P. as an intermediate standard to improve farm yield, adopt climate-smart agriculture practices, and increase hygiene and sanitation on farms. The company has also had a positive effect on food safety, worker welfare, and wildlife and biodiversity conservation. In 2017-2018, the company intends to increase the area Jain G.A.P. by 10,000 acres of white onions, 3,000 acres of mangoes, and 2,700 acres of bananas.

The company has sourced over 165,000 metric tons of Jain G.A.P.-certified white onions, 53,000 metric tons of bananas, and 17,000 metric tons of mangoes to process and sell globally to institutional buyers, resulting in up to a 70 percent reduction in irrigation water requirements due to micro-irrigation systems and bringing irrigated agriculture to additional land.

**Figure 11: Climate-Smart Agriculture Impact Summary**

Type	Description	Impact to Date
 Water-use efficiency	Reduced irrigation water demand; reduced farm water losses	<b>50 percent reduction in irrigation water demand</b>  <b>500,000 farmers adopted micro-irrigation systems</b>
 Smart land use	Improved farm output per unit	<b>15 to 20 percent increase in yields and farmer incomes</b>
 Enhanced resilience to droughts, pests, and diseases	Adaptation of CSA practices under Jain G.A.P.; scalability/outreach to more smallholders	<b>30,000 hectares of land certified in last 5 years</b>  <b>15,000 farmers trained</b>