



## Water Establishing landscape level water management

Optimising water use is one of the greatest contributions Olam can make to global food security and health. In 2013 we made a public commitment to reduce consumption in our direct operations. Our monitoring shows that in 2014, as we have advanced our farming projects, our rainwater consumption has increased. However, through improved irrigation and agronomy practices we have reduced the irrigation volume and intensity. In processing, ambient conditions have been challenging in many regions requiring higher water usage. Our 'Extracting Efficiencies' programme will therefore increase its focus on water in the coming year. This year we were appointed to the steering committee of the UN CEO Water Mandate.

### Landscape: Tanzania, Coffee

Olam subsidiary, Aviv Tanzania Ltd, has developed an Arabica coffee plantation alongside the Ruvuma River, in Lipokela Village, Ruvuma Region, Tanzania. Ensuring that the 1,064 hectare plantation and processing mill have access to water without jeopardising the ecosystem, or the needs of others, meant an Integrated Water Resources Management plan had to be developed.

The Plan included a dynamic multi-scenario water model based on:

- Assessment of upstream and downstream users' requirements
- A daily rainfall-runoff hydrological model to quantify flows using rain gauge datasets from the Ministry of Water, augmented with satellite data
- Aviv's agronomy and drip irrigation expertise

Workshops were held to share the model results with village leaders, the Ministry of Water, the local Benedictine Sisters from St Agnes Chipole Mission who operate a hydropower plant, the Urban Water Supply and Sanitation Authority, Dutch development financier FMO and German development agency GIZ Tanzania Water Division, the Ruvuma sub-basin Officer, and managers from Olam's other East African operations.

As a result, the Upper Ruvuma Catchment Basin Steering Committee was formed to share resources and knowledge for a more coordinated catchment management strategy.

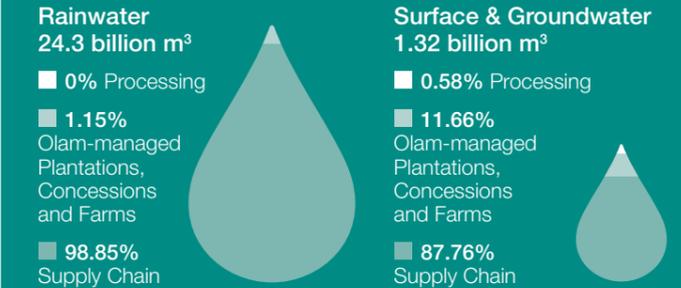
To ensure that the river does not go below its Minimum Environmental Flow, we have built a dam (1.5 million m<sup>3</sup>) for our irrigation and other requirements.

To reduce irrigation, Aviv has inter-planted 50,000 shade trees alongside the coffee. These trees will create a microclimate for growing coffee by reducing the evapotranspiration.

In 2015 we will construct a wet mill in which the wastewater will be treated by anaerobic and aerobic methods to ensure the quality of the effluent exceeds World Health Organization standards. Aviv is also seeking to achieve Alliance for Water Stewardship verification this year to formally demonstrate responsible use of freshwater across its entire operation.

## Global Perspective

### Olam's water footprint 2014



Reduced absolute volume used for irrigation by 5% and irrigation water intensity by 31% from 5,532 m<sup>3</sup>/tonne to 3,830 m<sup>3</sup>/tonne (2013 vs 2014). Processing intensity has increased from 1.98 m<sup>3</sup>/tonne of product to 3.1 m<sup>3</sup>/tonne (2013 vs 2014) due to adverse ambient conditions.

### Knowledge Transfer: More Crop Per Drop

The unprecedented drought in California has required greater water efficiency measures with each almond orchard having its own management plan dependent on ground and surface water availability.

A particular case is an orchard near Fresno that has become more reliant on groundwater but the pH and sodium levels are higher than preferred. This can block water infiltration and nutrient uptake in the root zone. Counter-measures include:

- Building soil moisture-retention capacity by applying compost, organic acids, biological soil amendments, and soluble calcium amendments
- Applying low pH water to solubilise calcium contained in limestone to displace sodium from the root zone
- Monitoring macro and micro-nutrient levels in leaves and soil. Also conducting aerial photography and spectral image processing to monitor water stress and tree health.

The knowledge gained through the More Crop Per Drop programme is now being transferred to the Australian almond team and to other irrigated products such as the coffee plantations in Tanzania and Zambia.



### Livelihoods

In July, HE Hon. President Dr. Jakaya Kikwete inaugurated a coffee outgrower programme. Over the next five years Aviv will supply three million coffee plants to 2,000 farmers free of charge.

We support community development with US\$3,000 per village per year. Liganga has elected to provide solar lighting for its school while Lusonga purchased desks. A dispensary in Lipokela is being built in collaboration with the village, the local Government, and SHIPO, a local NGO.



### Food Security

Aviv is promoting diversification of income by training outgrowers to inter-crop sesame and beans, and then purchasing their produce. In addition, a local partner will promote bee-keeping to 735 farmers.

We are also working with upstream rice farmers to improve their yields and make irrigation systems more water efficient.



### Land

Aviv's title deed relates to 2,000 hectares, however following Environmental and Social Impact Assessments, 829 hectares have been set aside for conservation.

We are undertaking a land use planning exercise to settle some disputes that should have been completed by the previous owners of the land.

Shade trees reduce pesticide use by attracting pest-eating birds, and the leaves act as a mulch.



### Labour

Aviv provides 2.5L/day of drinking water (as recommended by the ILO) for its 2,000 workers from the local community. 11 latrine blocks provide convenience throughout the plantation.

Workers are also provided with full protective gear, work eight hours per day with a one hour lunch (provided free of charge) and are paid slightly above the minimum wage for agricultural workers. We have a Workers' Committee and a Plantation Workers' Union.



### Climate Change

Through their hydropower plant, St Agnes Chipole Mission produces 7MW power using the Ruvuma River. As approved by the Government, Aviv will receive 2.5 MW from Chipole, meaning diesel generators will no longer be required and the carbon footprint of the plantation will be reduced by 2,000 tonnes CO<sub>2</sub>e per year.