



# Dorewa fund

An impact-oriented fund for hydroponics entrepreneurship in Niger

**THE CHALLENGE** → “Climate change has wreaked havoc in Niger, bringing floods, droughts, spikes in temperature and food shortages - buffeting the lives and livelihoods of millions of the country’s farmers” UN’s Office for the Coordination of Humanitarian Affairs – 2016

With over 80% of its land area covered by the Sahara Desert, Niger is one of the lowest-ranked country in the United Nations’ Human Development Index (HDI); it was ranked last at 188th for 2015. Agriculture represents 36% of GDP, while engaging 56% of total employment. We identified 4 main challenges that would need to be addressed in order to improve Niger’s situation:

- Agriculture is largely based on small-scale undiversified subsistence crops (pearl millet, sorghum, cassava, cowpeas, onions), with very little productivity and off-season cultivation
- Only 2% of arable lands have an irrigation system; therefore agriculture relies heavily on variable and insufficient rainfall (between 300mm to 600mm of rainfall annually), leading to severe drought since late 1960s
- Niger’s population has an annual growth rate of 4% since 2010, and is expected to double by 2030 (to reach 36 million), which places increasing stress on limited natural resources
- Niger relies on grain and food imports to meet requirements – In Niger, 1 year in 3 is associated with poor food security conditions – and this situation will worsen the population growth



Oumara Baraya is a 36 year-old farmer living in Kollo: “With my wife, we sell our onions every 2 months or so. With the revenues, we go to the Niamey market and buy some basic products and vegetables for my family - we have 4 kids. We cover the 30km distance with other villagers, by truck. It is a simple life”

**THE SOLUTION** → Dorewa (*sustainable in Haoussa, trade language across Sahel*) will invest in hydroponic farms in containers to reduce food scarcity and empower local entrepreneurship

### Technology

Hydroponics allows farmers to grow vegetables throughout the year in nutrient-rich aquatic-based environment without using soil. It increases throughput while reducing water consumption by up to 90%, the need for fertilizers by 60% and eliminating the need for pesticides. Other key advantages include reduced variability in quantity/quality and more automatized operations.

Dorewa will leverage on the modularity, increased automation and transportability of small scale hydroponic farms in containers powered by PV panels, to minimize the challenges in Niger.

### Business Model:

#### Key stages and summary of activities

Identify & train entrepreneur	Identify key communities and entrepreneurs in them for implementation Provide training in hydroponics, procurement, sales and accounting
Deploy capital & setup turnkey farm	Acquire equipment and provide capex for working capital requirements Setup turnkey hydroponic farm for operation (with maximum automated operation)
Support operations in pooled system	Provide support on production, accounting and sales through a pooled local team working with several entrepreneurs
Transfer ownership of asset (exit)	Cash-in by transferring the ownership of the asset to the entrepreneur

### Business Model (continued):

Dorewa will identify local entrepreneurs, train them and deploy the initial Capex needed to setup 190 hydro farms in exchange for a fixed rent (leased asset) paid throughout 10 years. During that period it will also provide a pooled support service to various farmers in a specific region. The exit will be made by transferring ownership of the asset to the entrepreneur after the defined period.

### Geographic reach:

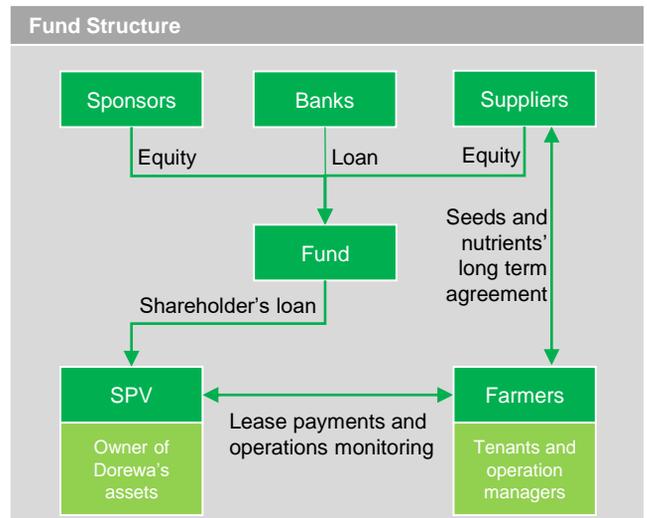
Most of the cities are located in the very south of the country, the northern region being arid. Due to climate conditions, agriculture is practiced only on 15% of the territory, where 85% of the population lives. Our project would be initially implemented in the Tillabéri province, and more particularly in the States of Say and Kollo (along the Niger River), where 92% of the rural population is involved in agricultural activity and where food represents 60% of household expenses.

The possibilities of scaling the project are limitless in the Sahel region: Niger, Mali and Mauritania imported respectively \$420, \$475 and \$250 million of food in 2015.

**THE FINANCIAL INSTRUMENT** → The fund will generate a 10% IRR by investing €16m in hydroponic farms and leasing the assets to local operators

### Fund Structure

The investment structure proposed for Dorewa is described in the figure below:



- The fund will leverage €16 million for a period of 10 years from its sponsor base (composed of multilateral investment banks such as International Finance Corporation and/or African Development Bank for the loans; impact-oriented investors and suppliers of seeds/nutrients for the equity) which will then be committed to a fully-owned SPV in the form of a shareholder's loan also with a 10 year term
- The shareholder's loan will be paid back and remunerated on a cash-sweep basis, starting after a grace period of 5 years
- The fund's equity sponsors will similarly receive all the funds generated by the SPV on a cash-sweep basis
- The SPV acquires the assets from standard modular hydroponics suppliers such as Freight Farm or Growtainer (turn key providers), and sets them up for production on-site. It then leases the assets to its tenants (the farmers) for a period of 10 years, thereby retaining their ownership in this period



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## Fund Structure (continued)

- The farmers operate the assets and pay a fixed lease rent to the SPV of €1,100 per month until the end of the 10 years period – after which they buy the asset at a salvage value

Fund termsheet:

<b>Fund term</b>	10 years
<b>Investment manager</b>	Dorewa (SPV)
<b>Target fund size</b>	€16 million
<b>Fund structure</b>	Plain vanilla private equity fund
<b>Target leverage</b>	40% D/V ratio
<b>Target investors</b>	Impact-oriented investors, multilateral development institutions, key hydroponics' suppliers
<b>Target IRR</b>	10,1% (gross of management fee)
<b>Fee structure</b>	1.5% management fee + 10% carried (7% hurdle rate)

The following assumptions were made in forecasting the cash flow potential of Dorewa:

- The cost of each container is estimated at €84k of which €69k refer to the container and its installation and €15k to the solar panels generating all required energy (each container is self-sufficient energy-wise)
- Each container has an area of 320 ft<sup>2</sup> and 2 stacks of hydroponic trays, each generating 40lbs per square foot of produce (e.g. tomatoes) – the average expected yield for such an operation
- The throughput is then projected to be sold at the average market price of tomatoes in Niamey, i.e. ~1,000 Francs CFA per kg (roughly €1.53 per kg)
- Operating expenses were estimated at 50% of the average developed market expenses, i.e. €150 per month per container
- Based on our market opportunity analysis we have capped the project at 180 containers (equivalent to 2,000 tons of production capacity per year)
- Asset O&M of €11k per year and a lease payment hazard rate of 5% were also estimated at the SPV (Dorewa) level
- The asset is sold to the tenant at the end of the 10-year lease agreement for an estimated 10% salvage value

Based on these projections a fixed €1,100 monthly rent was estimated as a feasible lease payment to be paid by the asset tenant during its 10 year lease agreement. This rent shall leave the tenant incentivized while providing the Fund with a reasonable level of return. The overall Fund's free cash flow under these assumptions is presented below:

Fund Free Cash Flow (€ millions, real value)



## THE IMPACT → Dorewa will supply 22 kton of quality vegetables with reduced environmental footprint and whilst creating 360+ jobs

Dorewa will have a direct impact both in the society and environment of Niger by boosting entrepreneurship and transferring know-how to the local community. The key figures of the impact are the following:

### Key figures on impact



**22 kTon. of vegetables** delivered in a predictable supply, reducing dependency on imports



**360 direct jobs** created in multiples communities with high potential for scalability



**1,7 million liters of water saved** annually versus traditional comparable farming



**0% pesticides used** in the production of the vegetables

## THE RISK/MITIGATION STRATEGY → The main risks that Dorewa faces can be reduced or mitigated through the involvement of key partners

Key risks	Mitigation
<b>Political risk</b>	Involvement of African Development Bank and/or International Finance Corporation as debtholders and endorsers of the project  Geographical positioning in the southern more stable areas of the country
<b>Local support</b>	Partner with the Government 3N initiative (Nigeriens Nourish Nigeriens that aims to help smallholder farmers in improving agriculture quality and quantity) and other NGO related activities in the area
<b>Business risk</b>	Include 5% default probability in the cash flow forecast  Pooled support team from Dorewa available on the spot  Invest in portable assets (containers) and recover them if needed
<b>Exchange rate exposure</b>	Funding aligned with revenues in terms of exchange rate (Franc CFA pegged to the € @ 655 XOF)

Sources:

Local sources; Interview with Oumarou Baraya 2017; World Bank 2017; Food and Agriculture Organization of the United Nations 2017; USAID 2012; AMCOW Country Status Overview 2015; United Nations Development Programme 2017; Freightfarms; Greentainers