



NIGER

INVESTMENT & PARTNERSHIP MAPPING

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CONTENTS

- 1. Executive Summary 1**
- 2. Approach & Methodology 4**
- 3. Overview of Niger’s economy 6**
- 4. Assessing Key sub-sectors 9**
 - 4.1 Sub-sector screening overview 9
 - 4.2 Selection of Sub-Sectors 13
- 5. Investment cases 22**
 - 5.1 Meat 22
 - 5.2 Cowpea 28
 - 5.3 Onion 34
 - 5.4 Solar 40
- 6. Conclusion 47**
- Annex A: Additional analysis on imports & exports 48**
- Annex B: Stakeholder list 50**
- Annex C: Sources Cited 52**
- Annex D: Investment case financial models 54
- Annex E: Long list of investment opportunities 54
- Annex F: Presentation – Information Market Gap Research 54
- Annex G: Presentation – Value Chain Investment Opportunities Analysis 54

LIST OF FIGURES

- Figure 1: Metrics for sub-sector prioritization 4
- Figure 2: Illustration of process for selecting the shortlisted investment opportunities 5
- Figure 3: Trends in export products and FDI flows 7
- Figure 4: List of sub-sectors and industries 9
- Figure 5a: Assessment of demand 10
- Figure 6: Assessment of Potential for job creation & Alignment 12
- Figure 7: Summary of prioritized sub-sectors following screening 13

Figure 8: Geographic distribution of selected sub-sectors	Error! Bookmark not defined.
Figure 9: Market characteristics and opportunities for meat export.....	23
Figure 10: Key constraints along the meat value chain.....	Error! Bookmark not defined.
Figure 11: Example of key requirements for cowpea buyer in Nigeria	29
Figure 12: Key constraints along the cowpea value chain.....	30
Figure 13: Selection of potential food and beverage and retail outlets that may source onion powder ...	35
Figure 14: Key constraints along the onion value chain	36
Figure 15: Overview of solar products market and barriers to entry in Niger	42

ACRONYMS

ANFO	National Association of Onion Farmers' Cooperatives
BAGRI	Banque Agricole du Niger
CAGR	Compounded Annual Growth Rate
CEO	Chief Executive Officer
CFAF	West African Financial Community franc
CGIAR	formerly the Consultative Group for International Agricultural Research
CTO	Chief Technology Officer
ECOWAS	Economic Community of West African States
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
FnB	Food and Beverage company
FISAN	Food Security and Nutrition Investment Fund
GDP	Gross Domestic Product
Ha	Hectare
I3N	Nigeriens Feeding Nigeriens Initiative
ICT	Information and Communications Technology
IRR	Internal Rate of Return
K	Thousand
KG	Kilogram
kWh	kilowatt hour
MFI	Microfinance institutions
MNO	Mobile Network Operator
MT	Metric Ton
NESAP	Niger Solar Electricity Access Project
NGO	Non-governmental organization
PAYG	Pay as You Go
PICS	Purdue Improved Crop Storage
R&D	Research and Development
REGIS-AG	Resilience and Economic Growth in the Sahel – Accelerated Growth
SFDA	Saudi Food and Drug Authority
SHS	Solar home system
SME	Small and Medium Enterprise

SMLS	Small multi-room lighting system
SNV	SNV Netherlands Development Organization
SOE	State-owned enterprise
SPS	Sanitary and Phytosanitary
SSA	Sub-Saharan Africa
UAE	United Arab Emirates
USAID	United States Agency for International Development
USD	United States Dollar
VSF	Veterinarians Without Borders
WTO	World Trade Organization

I. EXECUTIVE SUMMARY

USAID is working to spur private sector-led growth in Niger by supporting potential domestic or international investors.

Niger has experienced an average annual GDP growth rate of 6.6% over the last 10 years, mainly driven by agriculture, livestock, trade and telecommunications. Niger's exports – primarily comprised of uranium, oil seeds, and refined petroleum – more than doubled between 2015 and 2017.¹ Some key initiatives are underway to improve the business environment and attract more investment, including the revision of the labor law to address human capital constraints and the establishment of an agency for the support of public-private partnership investments, among others.

However, Niger faces key challenges related to its geography and governance. High road transportation costs – which are exacerbated by poor infrastructure – increase the price of goods produced in the country. Niger has one of the world's fastest growing working-age population, but the labor market is faced with many challenges and much of the labor force is engaged in the informal sector. Niger's GDP per capita at USD 378 is among the lowest in the world and limits purchasing power—but this is mitigated to a certain extent by the country's proximity to Nigeria with the potential to serve a market of 200 million people.²

In spite of these challenges, there are readily available investment opportunities in areas where Niger has both strong current activity and growth potential in regional and international exports – this combination justifies the efforts investors will need to make to overcome key structural challenges of the Nigerian market (landlocked geography, insecurity, poor infrastructure).

This report provides analysis of Niger's main sub-sectors with potential for commercial investment. From an initial 12 pre-identified sectors of opportunity, over thirty sub-sectors were included in the initial screening for commercial opportunities. What emerged was three categories of sub-sectors that differed based on their potential for commercial returns and potential for social impact (as measured by potential for job creation for Nigeriens). Further analysis was conducted of the sectors with both high commercial and job creation potential: cowpeas, onions, meat, dairy, hides, skins and leather, moringa, artisanal goods, solar, transport, and ICT/digital infrastructure. Analysis of the market demand, competitiveness, and commercial viability led to a selection of four commercial opportunities for which financial models of returns on investment and business cases were developed.

Of the four business cases, meat and cowpeas were identified as having the strongest commercial viability for private investment in the short term. Other opportunities were identified in the solar sector, though medium-term support to solar businesses and consumer finance are needed to unlock growth in the industry. This report also highlights the potential opportunities in onions, but finds that their commercial viability is still a ways off given current levels of production for processing.

- **Investment Case - Meat and by-product manufacturing:** The commercial opportunity in meat consists of an initial investment of approximately USD 3.7 million in an abattoir with a

¹ World Bank, World development indicators database, 2017; International Trade Center, ITC Trademap database, 2017; Government of Niger, Plan de développement économique et social 17-21, 2017

² World Bank, World development indicators database, 2017

capacity of 800 MT per year, and an internal rate of return (IRR) of 32% over 10 years.³ This opportunity is the most attractive given the scale of the investment, the high potential for growth, and the likelihood of attracting potential buyers in destination markets as co-investors. The opportunity builds on a strong track record of production and trade – and aims to rebuild a defunct processing industry. Niger exports a large number of live animals, thereby foregoing the value-add of meat production as well as the value of by-products (hides, horns etc.). The business can be commercially viable and sustainable if it is of sufficient scale from the start (800 tons of meat exports a year). The opportunity requires securing big contracts from buyers early on, having donor and government support to facilitate access to meat export markets (e.g., Saudi Arabia) and establishing a traceability system.

- **Investment Case - Cowpea aggregation:** An initial investment of approximately USD 3 million is needed to export 10,000-11,000 MT of cowpeas per year with an IRR of 26% over 10 years. Building on a strong track record of production and trade and recognizing the growing demand of the key trading partner Nigeria, Niger can professionalize its cowpea export offer to both increase volumes and capture a greater portion of value addition. This opportunity consists of aggregating existing, dispersed and largely informal trade flows and can evolve towards a vertically integrated production-and-trade play. The business does not require specific policy or government interventions to operate, but can benefit from support on the upstream value chain, more specifically on access to improved seeds, agriculture financing and building the capacity of target farmers in production areas (Maradi and Zinder). Given Nigeria is the main target market for export, this business will likely be exposed to the naira/euro exchange rate fluctuations, which might affect profitability. This opportunity is at a smaller scale than meat production, and would contribute to employment and improving the livelihoods of 10,000+ Nigeriens.
- **Investment Case – Onion aggregation and processing:** The commercial opportunity in onion consists of an estimated USD 1.4 million investment in processing the Blanc de Gotheye variety into onion powder (up to 2,000 MT of raw onion per year), with a potential IRR of 24%. Niger is the second exporter of onions in the ECOWAS market, with exports having grown by 14% to reach USD 12 million in 2017.⁴ The country is well-positioned to strengthen its competitiveness in the region, with a comparative advantage in yield and production costs on onion varieties for export (Violet de Galmi) and processing (Blanc de Gotheye).
- **Investment Case - Solar energy for household use:** An estimated USD 1.9 million is needed to provide access to electricity to 10,000-15,000 households, with a potential return of 12% over 10 years. Given over 90% of households are off-grid, Niger is a high potential market for solar players already established in francophone West Africa, where countries share currency in addition to sharing the language.⁵ Niger can be of particular interest to players that are operating in smaller markets (e.g., Benin or Senegal), and that have perfected their Pay-As-You-Go (PAYG) model for energy access. Given a relatively limited purchasing power, the investment would need effective consumer financing mechanisms to grow.

USAID and other stakeholders in Niger have an opportunity to showcase these potential opportunities to drive growth in the country. Meat, cowpeas, onions, and solar energy will need product-specific support and general sector and investment support. This includes a need for better linkages between smallholder farmers (or farmers’ organizations) and the vertically integrated businesses. Support is also needed to improve the enabling environment and reduce trade barriers related to Niger’s geography – with specific focus on limiting corruption and bribery on key trade routes and border crossings that contribute to high costs, frequent delays, and product losses. The report and its supporting

³ Dalberg analysis, 2019

⁴ International Trade Center, ITC Trademap database, 2017

⁵ Open Capital Advisors, Niger Off-grid solar market assessment, 2017

documents (i.e., investment case financial models, consolidated long list of investment opportunities, and presentations) identify key factors affecting the profitability of the investment cases and provide high-level guidance to key actors on how or where to engage.

2. APPROACH & METHODOLOGY

USAID is working to spur private sector led growth and market revitalization in Niger by assisting potential domestic and international investors. The USAID Investment Support Program (ISP) launched a market analysis study to identify potential areas for commercial investments into Niger. The objective of the study was to conduct a rapid market analysis to identify areas of opportunity from a commercial perspective and analyze a selection of investment opportunities in-depth. From the broad scan of 30+ sub-sectors, three emerged as having high potential and contributing to the long-list of investment opportunities. The main approach involved screening a wide set of opportunities, and prioritizing the high-potential sub-sectors for commercial investment.

Initial screening: For the initial screening, the study drew on desk research and stakeholder interviews to identify sub-sectors of opportunity from a commercial perspective, which resulted in a longer list of opportunities.⁶ The analysis assessed the scale and growth of imports and exports, the feasibility of entering or expanding certain products, the ability for Niger to engage in key sectors based on the presence of key skills or logistics, and the traction and momentum around certain sub-sectors based on support from government, private sector, and other donors. A key output of the screening process was a long list of potential opportunities.

The initial screening resulted in two groups of projects:

1. Profitable projects that create jobs, with high feasibility and readiness and that align with USAID priorities
2. Enabling projects, which will be catalytic in providing key solutions in energy, transport, or ICT, with high feasibility and readiness

Prioritization: From the initial screening, each of the top 10 sub-sectors were assessed and prioritized based on their commercial viability, feasibility and readiness, and impact potential. Specific metrics for each factor is as follows:

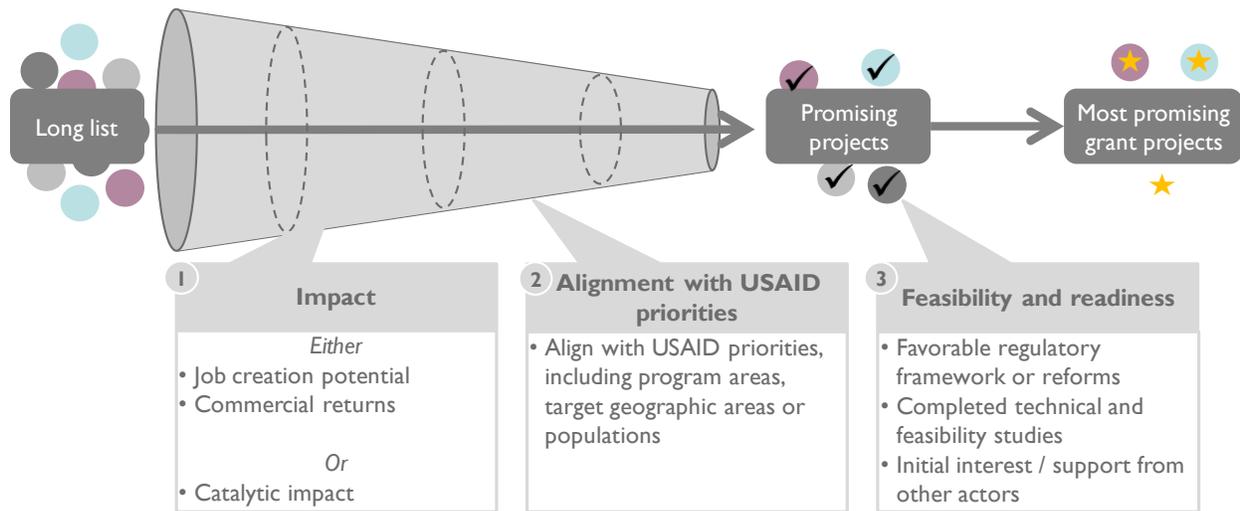
Figure 1: Metrics for sub-sector prioritization

Commercial viability	Feasibility/Readiness	Impact potential
<p>Market demand</p> <ul style="list-style-type: none"> • Domestic and exports • Market size <p>Competitiveness</p> <ul style="list-style-type: none"> • Why does it make sense to produce the commodity in Niger? What makes Niger a perfect place for the product? (yield, geographical positioning, knowhow, etc.): Businesses can do more or businesses can produce at a cheaper price or businesses can do it better 	<p>Policies and regulations that enable sector development</p> <ul style="list-style-type: none"> • What are the government initiatives in place to support investors? Investment incentive schemes, etc. (Build-Operate-Transfer (BOT), liberalization of the energy sector, etc.) <p>Barriers to entry/constraints</p> <ul style="list-style-type: none"> • What are the binding value-chain constraints (access to water, electricity, ICT, logistics, etc.)? How likely are those constraints to significantly improve in the near future (3-5 years)? 	<p>Potential job creation</p> <ul style="list-style-type: none"> • Number of jobs • Intensity of jobs for Nigeriens

⁶ The consolidated list of opportunities is part of a separate document.

Identify investment opportunities: From the long list of opportunities, four were chosen that present attractive returns, impact and can move forward in the next 2-3 years. For impact, those opportunities with the highest job creation potential and commercial returns or those which can have catalytic impact for the most Nigeriens were identified. For alignment with USAID priorities, the study assessed the opportunities based on those that aligned with program areas, target geographic areas or populations. For feasibility and readiness, the study reviewed the existence of favorable regulatory frameworks or reforms, technical and feasibility studies indicating readiness in identified opportunities, and initial interest or support from other actors in the ecosystem. Additional research and analysis were conducted of the investment case for these four opportunities.

Figure 2: Illustration of process for selecting the shortlisted investment opportunities



3. OVERVIEW OF NIGER'S ECONOMY

In many ways, Niger is an untapped market that is ripe for investment to support further growth of industry and productive sectors. Niger's landlocked geography and proximity to insecurity detract from its overall attractiveness as an investment destination but are moderated by the country's positioning next to Nigeria's sizeable domestic market (population of 200 million) and high consumption. Niger shares 1,000 miles of border with Nigeria and has strong established trade of key products including: livestock (including hide and skin), cowpeas, and onions.

Niger has experienced an average annual GDP growth rate of 6.6% over the last 10 years, mainly driven by agriculture, livestock, trade and telecoms. The economy depends essentially on farming and livestock, which account for about 40% of GDP.⁷ Farming is dominated by rain-fed agriculture, however there is an increasing push from government and donors to develop irrigation, and commercial farming through initiatives such as I3N (Nigeriens feed Nigeriens). Niger has significant mineral wealth with deposits of uranium, gold, coal, and recently crude oil being commercially exploited. Extractives were the fastest growing sector between 2010 and 2015 (25% on average), but variability in commodity prices affect investments and the sector growth.⁸

Niger is at the heart of the West African Economic and Monetary Union (WAEMU) and the Economic Community of West African States (ECOWAS), while giving access to the Maghreb and central African regions through existing trade corridors. Though Niger's main port access is through the Port of Cotonou in Benin, Nigerien traders maintain close relations with several countries in the region, including Burkina Faso, Côte d'Ivoire, Ghana, Mali and Nigeria. Niger's economy is heavily integrated with that of Nigeria, with historical links built through shared ethnicity (Hausa) and several trading markets along the 1,000 mile border with Nigeria (at least seven major cowpea markets).⁹ Niger is a leading exporter of cowpeas in Nigeria and Nigeria is the first export destination for Nigerien livestock, receiving more than 95% of the total livestock products exported from Niger.¹⁰

Niger's exports have more than doubled between 2015 and 2017. From 2013 up until 2015, Niger's main exports were radioactive chemical products, mineral fuels and oils as well as precious stones and pearls. The country then experienced a sharp increase in demand for animal fats, animal oils and cereals from Nigeria and Benin in 2016 and 2017 that led to an increase in export value. Niger's main export partners have been Benin, Burkina Faso, France and Nigeria – with Benin and Nigeria dramatically increasing their imports in 2017.¹¹ However, Foreign Direct Investment (FDI) flows have contracted as a result of unfavorable commodity prices for oil and uranium. FDI flows are vulnerable to shock in prices in the

⁷ World Bank, World development indicators database, 2017; International Trade Center, ITC Trademap database, 2017; Government of Niger, Plan de développement économique et social 17-21, 2017

⁸ World Bank; GoN, Plan de Développement Economique et Social du Niger; Niger 2035 Inclusive Growth Plan

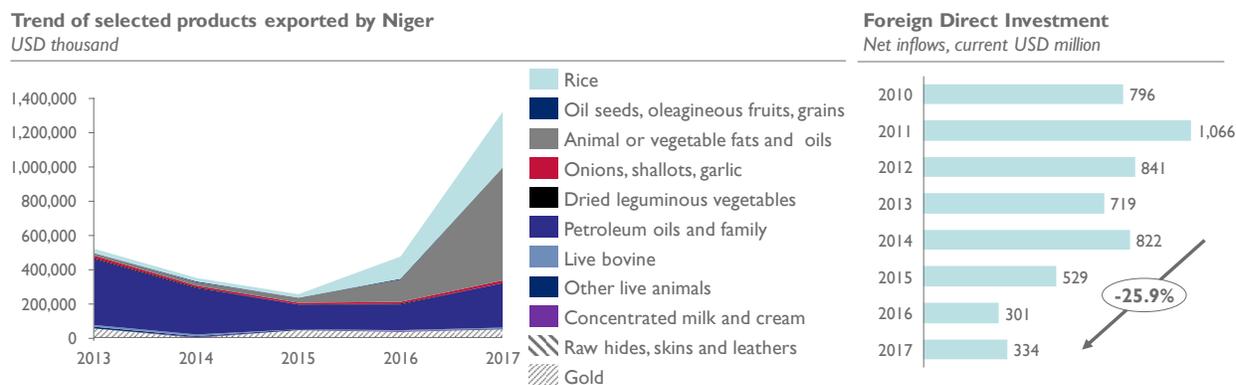
⁹ United States Agency of Development, Production and trade flow map: Niger cowpeas, 2017

¹⁰ International Trade Center, ITC Trademap database, 2017

¹¹ International Trade Center, ITC Trademap database, 2017; Government of Niger, Annuaire statistique du Niger, 2013-2017

extractive industry, especially uranium, demonstrated by a high peak in 2011 linked to a sizeable increase in uranium prices, and a decrease in 2016 along with a drop in the commodity's price.¹²

Figure 3: Trends in export products and FDI flows



Niger faces key challenges related to its geography, which also have implications for its economic growth trajectory and ease of doing business:

- **Geographic position limiting access to markets:** Niger is a vast landlocked country and has historically relied on the Port of Cotonou (Benin) and to a lesser degree that of Lomé (Togo), Tema (Ghana) and Port Harcourt (Nigeria), for overseas trade. High road transport costs and poor infrastructure raise the price of goods produced and can render them less competitive.¹³
- **Education and employment challenges:** Nigeriens have an average 1.4 years of schooling, with around 80% of the population without any formal education. The country has one of the world's fastest growing working-age population, but the labor market is faced with many challenges and is primarily engaged in the informal sector.¹⁴
- **Small internal market with limited purchasing power:** The GDP per capita at USD 378 is amongst the lowest in the world and limits purchasing power.¹⁵ Monetary stability has been relatively well-sustained given Niger's membership in the West African CFA Franc Zone.¹⁶
- **Volatile security situation:** The security situation in the Diffa region has been volatile since the arrival of Boko Haram in 2015. Niger also faces spillover violence from conflicts in Libya and Mali. These security threats expose Niger to significant external shocks. Increased security risks in the mining region might have led to a decrease in foreign investment.
- **Limitations of the judicial system:** According to a 2017 World Bank country diagnostic, the effectiveness of the judicial framework remains limited, and the court system is perceived as vulnerable to political pressure. Niger held the 112th position out of 175 countries on the 2017 Corruption Perceptions Index, compared to neighboring countries such as Senegal (66th), Burkina Faso (74th) and Benin (85th) whose corruption prevalence was judged less acute.¹⁷

¹² World Bank, World Bank Development Indicators, 2019; Trading economics, Uranium prices, 2017; US Department of State, Niger's investment flows, 2014; The Economist, License issued for Madaouela, 2018; various websites of extractives projects

¹³ Danish Trade Union Council for International Development

¹⁴ Niger Labor Market Profile, 2014

¹⁵ World Bank, World development indicators database, 2017

¹⁶ African Bank of Development, African Economic Outlook, 2019

¹⁷ Corruption Perceptions Index, Transparency International, 2017

There continues to be interest from a diverse set of private actors to enter Niger – several recent deals are moving forward mostly focused on serving the domestic market. Google’s Project Loon may bring 4G internet to remote areas by launching mobile cell phone towers. The Dubai-based solar firm Phanes Group provided off-grid solar electricity to 110 households in Boki village as a pilot project providing proof of concept for mini-grids and solar home systems in remote communities. The Dangote Group has launched the construction of a cement plant at a cost of USD 360 million expected to generate 750 new direct jobs. Proparco, the private investment arm of France’s Agence française de développement (AFD) has signed a new agreement with West Africa-focused investment firm Teyliom to provide USD 11.7 million in funding for the construction of an upscale hotel in Niamey. Malbaza Ciment Co (MCC SA) has begun operations at its new 0.65Mta plant, which produced its first ton of cement in late December 2018.¹⁸

Going forward, supporting investments (some of which are already planned) in energy, infrastructure, and human capital will help decrease transaction costs and make Niger more competitive. Niger has already made significant progress on its transport and logistics performance and workforce development but needs additional investment if it is to compete with other regional players.

¹⁸ Government of Niger, Communiqué du conseil des Ministres du vendredi 2 novembre 2018, 2018; DevFinance, Deal Round-Up, 2018; CEMNET, Malbaza Ciment begins operation of new plant, 2019

4. ASSESSING KEY SUB-SECTORS

4.1 SUB-SECTOR SCREENING OVERVIEW

From the initial 12 sectors identified, desk research and stakeholder consultations highlighted over 30 sub-sectors to further investigate. These sub-sectors and industries were assessed based on demand, potential for job creation and alignment with government and USAID priorities. The figure below lists all sub-sectors under consideration in the initial screening process:

Figure 4: List of sub-sectors and industries

Primary sector	Secondary sector	Tertiary sector
Agriculture	Creative industries	Education & TVET
Onions	Leather work	Professional training
Rice	Jewelry	
Moringa	Cosmetics & perfume	Financial services
Cowpeas	Home décor	Mobile money
Sesame		Commercial banking
Yellow Nutsedge	Construction	Insurance
	Cement production	
Livestock	Energy	Hospitality
Meat	On-grid solar	Hotels
Dairy	Off-grid solar	Restaurant/catering
Animal feed	Extractive industries	Telecoms/ICT
	Uranium	Digital infrastructure / Internet access
	Oil and Gas	Ag tech
	Fertilizer production	Transport & logistics
	Organic fertilizer	Road construction & management
	Chemical fertilizer	Transport companies
		Cold chain

Key research questions were defined to guide the research:

Assessment criteria	Key research questions
Demand	<ul style="list-style-type: none"> • What is the size of the market? • Where does the sub-sector have the strongest play domestically, regionally or globally? • What is the market price? Can customers pay the price?
Potential for job creation	<ul style="list-style-type: none"> • How job-intensive is the sub-sector (proxy number of jobs)? • Who typically fills those job positions (Nigeriens, other West African nationals, others)?
Alignment	<ul style="list-style-type: none"> • Is this sub-sector aligned with national priorities? • Is this sub-sector aligned with USAID priorities?

4.1.1 DEMAND

As part of the initial screening, the study assessed the level and type of demand likely to be generated within a given sub-sector or industry. Domestic demand included: i) Demographic-driven domestic demand, where sub-sectors might experience growth due to rapid urbanization or income shifts; ii) Latent

demand, where there is untapped domestic or regional demand that improved logistics can unlock; and iii) Import-substitution, where imports can be replaced by domestic producers, e.g., rice, eggs, oil palm, and poultry.

International demand included opportunities related to: i) Regional exports, where there are exports that meet demand in neighboring countries, often coupled with domestic supply; and ii) Global exports, where there are exports that meet broader global demand, taking market share from others.

Figure 5a: Assessment of demand likely to be generated in the selected sub-sectors

		Demand	
Legend		Strongest play	Rationale
High / growing demand			
Stable demand			
Low / stagnant demand			
Agriculture	Onions	Regional exports	• USD ~12 million exports all to West and Central Africa; Average price per ton is USD 119 in 2017; exports in value have increased between 2016 and 2017 by 16%
	Cowpeas	Regional exports	• USD ~15.5 million exports, 2nd largest producer in Africa with highest area harvested, but with very low domestic consumption. Average market price per ton was USD 639 in 2017. Export selling price per ton was USD 564 in 2016
	Moringa	Domestic; Global exports	• Moringa is the main green vegetable consumed in Niger with a CAGR of 115% between 2013 and 2016. Farmgate price is USD 134/ton with an average production cost of USD 76/ton*. Niger has the potential to tap into the global market which has an annual growth of 9%
	Rice	Import substitution	• Only 25% of demand met by local production; local rice is ~10% cheaper than imported rice. However, it is of lower quality as processing remains artisanal. Local rice is not yet very popular in cities
	Yellow Nutsedge	Regional exports	• 3,000 to 14,000 tons exported to regional markets, mainly informally, with Spain as only international importer. Potential for exports is not known
	Sesame	Global exports (small scale)	• Growing world demand but low yield (0.42 ton/ha vs 1.1 in Nigeria in 2017); and production has to compete with cereals
Livestock	Meat	Regional exports	• Export of live cattle and meat represents nearly 12% of total exports (96% of which goes to Nigeria and the remaining to Côte d'Ivoire and other coastal countries). Expansion opportunities exist for export to Ghana, Côte d'Ivoire and Benin which comprised over 72% of meat imports in ECOWAS in 2017 (USD ~338 million)
	Dairy	Domestic	• Gov. seeks to increase milk production by 40% by 2021, by increasing private dairy farms from 391 in 2015 to 800 in 2021
	Animal feed	Domestic	• In July 2018, the deficit in animal grazing was estimated at 111 M tons. However, many breeders (mainly informal) cannot afford the market prices of animal feed. The sub-sector is not commercially viable as Gov., donors and NGO's approach is focused on setting up community-led animal feed banks and provide grants in times of food insecurity
Creative industries	Leather work	Import substitution	• Niger currently exports raw skins and hides (mostly to Nigeria) and reimports them processed. In 2017, skins and hides exports were USD 1.4 million vs USD 1.3 million for imports. This indicates the potential for import substitution. There are local traditional tanneries, which processed ~3.7 million skins and hides in 2017
	Jewelry	Regional exports	• Between 2013 and 2017, Niger exported USD ~46.3 million/year, mainly to the region. The regional market absorbs 83% of Niger's creative goods.
	Cosmetics & perfume	Regional exports, latent	• Exports increased from USD 104,000 to USD 876,000; interviews suggest that it remains informal and not at scale
	Home décor	Domestic	• No information is available on this; interviews suggest that it remains informal and not at scale

Source: ITC Trademap; FAOstat; CTA, Fiche technico-économique sur les conditions de production et commercialisation de feuilles fraîches de Moringa au Niger, 2017; RECA, Note d'analyse sur la filière riz au Niger, 2014; EDIC, modernising trade during a mining boom, 2008; US Export.Gov, Niger - Agricultural Sector, 2017; INS, Annuaire Statistique, 2013-2017; UN-OCHA, Bulletin humanitaire Niger, 2018; UNCTAD, Creative Economy Outlook, 2015; CICR, Niger: des banques d'aliments pour sauver le bétail, 2018; Stakeholder interviews

Figure 5b: Assessment of demand likely to be generated in the selected sub-sectors (cont.)

Legend			Demand	
 High / growing demand	 Stable demand	 Low / stagnant demand	Strongest play	Rationale
Construction	Cement production	Import substitution	Stable demand	<ul style="list-style-type: none"> Niger imports ~70-80% of its needs for cement from Nigeria, Benin and Togo. Imports have increased by 10% between 2013 and 2017. In 2017, cement imports were USD 79 million for +695,000 tons. A new Nigerien-company (MCC) started operations in 2018 and aims to cover 80% of local demand. Another cement factory is also under construction, so the market may soon be saturated
Energy & extractives	Uranium	Global exports	High / growing demand	<ul style="list-style-type: none"> Niger currently produces 8% of the world's uranium, but this is expected to rise as global production is projected to grow by 4.8%
	Oil and Gas	Global exports	Stable demand	<ul style="list-style-type: none"> Niger is the 18th oil producer in Africa. Gov. seeks to increase production from 90,000 to 110,000 barrels/day by 2021
	Energy- On grid solar	Domestic	High / growing demand	<ul style="list-style-type: none"> Gov. seeks to install +150 MW on the grid from renewables by 2030, through funding from government and donors
	Energy- Off grid solar	Domestic	High / growing demand	<ul style="list-style-type: none"> Gov. seeks to install +100 MW off-grid from renewables by 2030. Low purchasing power limits individual demand, but businesses have willingness to pay. Government and the World Bank have set up a subsidy fund of USD 10 million
Fertilizer	Organic fertilizer	Domestic	Low / stagnant demand	<ul style="list-style-type: none"> Niger is the lowest user of fertilizers in the region: In 2015, fertilizer usage was ~0.6 kg/ha of arable land compared to 50 kg in Côte d'Ivoire
	Chemical fertilizer	Domestic	Low / stagnant demand	
TVET	Professional training	Latent, domestic	Low / stagnant demand	<ul style="list-style-type: none"> TVET is a key priority for government and there is high need for training; however it is mainly a public activity (not part of commercial PDES projects)
Financial services	Mobile money	Latent, domestic	Stable demand	<ul style="list-style-type: none"> Only around 3% of Nigeriens used mobile money in 2014. Extensions in mobile penetration and usage have the potential to contribute to wider economic activity, but they are currently limited by low subscription rate: the unique subscriber penetration rate was 24% in 2016
	Commercial banking	Domestic	Low / stagnant demand	<ul style="list-style-type: none"> The banking and insurance sectors have grown by 5% annually between 2013 and 2017, but with limited contribution to GDP (1%), compared to other WAEMU countries (e.g. 3.8% for Senegal)
	Insurance	Domestic	Low / stagnant demand	
Hospitality	Hotel construction	Domestic	Stable demand	<ul style="list-style-type: none"> Increasing Niger's accommodation capacity was identified as a priority in PDES 2017-2021, however, as Niger will host the African Union Summit in 2019, many accommodation facilities (incl. Radisson hotel and 15 presidential residences) are under construction
	Restaurants and catering	Domestic	Low / stagnant demand	<ul style="list-style-type: none"> Restaurants and catering services account for 1% to all food-related jobs (incl. agriculture). Catering services will likely be small in a near future, given urbanization (which is a key driver to the growth of this sub-sector) remains low (16%) compared to the Sub-Saharan African's average (40%)
Telecoms / ICT	Digital infrastructure / Internet access	Domestic	High / growing demand	<ul style="list-style-type: none"> Close to 97% of the population is not connected to internet Gov. is seeking PPP investments to upgrade the telecommunication infrastructure and digitally connect around 15,000 villages in Niger to speed up and facilitate the connection of more than 85% of the population
	Ag tech	Latent, domestic	Low / stagnant demand	<ul style="list-style-type: none"> Agtech is still nascent and demand remains low mainly due to limited internet access (3% of population with access) and purchasing power
Transport & logistics	Road construction & management	Latent domestic	Stable demand	<ul style="list-style-type: none"> The Nigerien road network is estimated at 12,653 mi incl. 2,854 mi paved roads (22.6%), 5,368 mi in laterite (42.4%) and 4,431 mi of basic runways (35%). The road network has only increased by 1% annually between 2013 and 2017. Gov. seeks to build 310 mi+ roads per year. As resources mobilized (USD 7.2 million in 2016) remain insufficient compared to the potential, gov. is looking for ways to increase the fees collection.
	Transport companies	Domestic	High / growing demand	<ul style="list-style-type: none"> The transport sector plays an essential role in Niger's economy. The truck fleet increased by 10% between 2013 and 2017. Transport prices for delivery from ports in neighboring countries to Niamey range from 15 to 20% of import costs.

Source: ITC Trademap; FAOstat; GoN, PDES 2017-2021, 2017; World Bank, SCD, 2017; INS, IPMC, 2018; NIGELEC, Projet d'Accès à l'Énergie Solaire au Niger, 2017; OECD, Agriculture, Food and Jobs in West Africa, 2018; ANSI website, Telco. Agency Report, 2017; Deloitte, Digital inclusion and mobile sector taxation in Niger, 2017; Stakeholder interviews

4.1.2 POTENTIAL FOR JOB CREATION & ALIGNMENT

The assessment also revealed high potential for job creation and alignment with the government and USAID priorities across sub-sectors. The analysis roughly estimated the number of jobs per sector based on desk research and interviews, and also indicated the level of labor intensity for Nigeriens in those jobs.

Figure 6: Assessment of potential for job creation & alignment with government and USAID priorities

		Potential for job creation		Alignment	
		# Jobs	Labor int'y for Nigeriens		
Agriculture	Onions	~46,000*	High (Nigeriens)	✓	✓
	Cowpeas	~10 M*	High (Nigeriens)	✓	✓
	Moringa	~13,300*	High (Nigeriens)	✓	✓
	Rice	~120,000*	High (Nigeriens)	✓	✗
	Yellow Nutsedge	~40,000*	High (Nigeriens)	✗	✗
	Sesame	~235,000*	High (Nigeriens)	✓	✓
Livestock	Meat	~18,000	High (Nigeriens)	✓	✓
	Dairy	~125,000	High (Nigeriens)	✓	✓
	Animal feed	~28,000	High (Nigeriens)	✓	✗
Creative industries	Leather work	~900,000	High (Nigeriens)	✓	✓
	Jewelry	~900,000	High (Nigeriens)	✓	✓
	Cosmetics & perfume	N/A**	Low (Nigeriens)	✗	✗
	Home décor	N/A**	Low (Nigeriens)	✗	✗
Construction Energy & extractives	Cement production	~7,000/plant	High (Nigeriens)	✓	✓
	Uranium	~<1000/plant	Low (Mostly non-Nigerien)	✓	✗
	Oil and Gas	~<1000/plant	Low (mostly non-Nigeriens)	✓	✗
	Energy- On grid solar	~2,600*	High (mostly Nigeriens)	✓	✓
	Energy- Off grid solar	~1,800*	Medium (mostly Nigeriens)	✓	✓
Fertilizer	Organic fertilizer	~<1,000	Low (Nigeriens)	✓	✓
	Chemical fertilizer	~<1,000	Low (Nigeriens)	✓	✓
TVET	Professional training	~<1,000	Low (Nigeriens)	✓	✓
Financial services	Mobile money	2,000	High (mostly Nigeriens)	✓	✓
	Commercial banking	1,600**	High (mostly Nigeriens)	✓	✓
	Insurance	1,600**	High (mostly Nigeriens)	✓	✓
Hospitality	Hotels	6,724*	High (Nigeriens)	✓	✓
	Restaurant/catering	6,724*	High (Nigeriens)	✓	✓
ICT	Digital infrastructure / Internet access	2,000	High (Nigeriens)	✓	✓
	Ag tech	N/A**	Low (Nigeriens)	✓	✓
Transport & logistics	Road construction & management	4,321***	High (Nigeriens)	✓	✓
	Transport companies	+2,000***	High (Nigeriens)	✓	✓

Source: FAOstat; Niger’s government, PDES 2017-2021; EDIC, modernizing trade during a mining boom, 2008; USAID, Resilience in the Sahel Enhanced (RISE); Yeeray et.al, Opportunities for the development of the moringa sector in Bangladesh, 2017; INS, Emploi, Chômage et Pauvreté au Niger, 2006; Deloitte, Digital inclusion and mobile taxation in Niger, GSMA, 2017

4.2 SELECTION OF SUB-SECTORS

Based on the indicative figures and research on demand, potential for job creation, and alignment, the screening process yielded three categories of sub-sectors:

1. **Sub-sectors with both strong demand and job creation potential:** These sectors were prioritized for further analysis. The sub-sectors included in this category are cowpeas, onions, meat, dairy, hides, skins, and leather, artisanal goods, moringa, solar energy, transport services, and ICT/digital infrastructure.
2. **Sub-sectors with strong job creation potential or strong demand:** These sub-sectors were found to have some discrete investment opportunities, which were added to the long list, but no further analysis was conducted. The sub-sectors included in this category are rice, yellow nutsedge, sesame, animal feed, cement production, uranium, mobile money, hotel construction, restaurants and catering, and road construction and management.
3. **Sub-sectors with limited commercial potential that are unlikely to create jobs at scale:** These sub-sectors were screened out and were not included in the long list of opportunities. The sub-sectors included in this category are cosmetics and perfume, home décor, oil and gas, organic fertilizer, chemical fertilizer, professional training, commercial banking, insurance, and agriculture technology services.

Ten sectors emerged from the screening and prioritization process. Each was assessed based on their commercial viability, feasibility and readiness, and impact potential, as outlined in the sections below.

Figure 7: Summary of prioritized sub-sectors following screening

	Demand	Potential for job creation	Alignment	
Cowpeas	Regional exports	~10 M	✓	✓
Onions	Regional exports	~46,000	✓	✓
Meat	Regional exports	~18,000	✓	✓
Dairy	Domestic	~125,000	✓	✓
Hides, skins, and leathers	Import substitution	~900,000	✓	✓
Artisanal goods	Regional exports		✓	✓
Moringa	Domestic; Global exports	~13,300	✓	✓
Solar energy	Domestic	~2,600*	✓	✓
Transport services	Domestic	+2,000***	✓	✓
ICT (digital infrastructure / internet access)	Domestic	2,000	✓	✓

4.2.1 COWPEAS

Niger is well positioned to increase its regional export of cowpeas given the large size of area harvested and its strategic position relative to the sizeable demand in the Nigerian market. There is strong demand for cowpeas in West Africa, and particularly in Nigeria, which imports 600,000 tons per year.¹⁹ Niger has the following advantages with its cowpea exports that support its competitiveness:

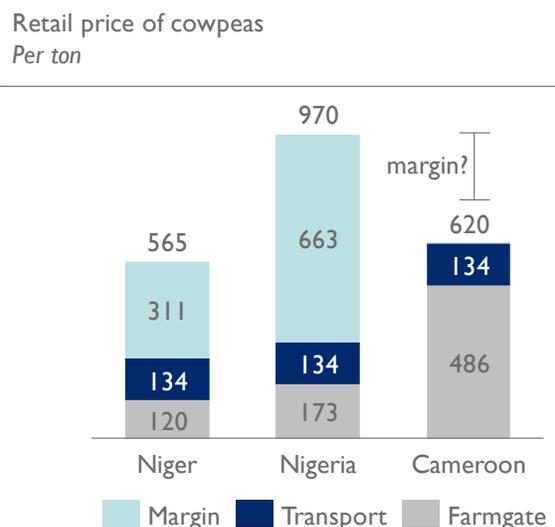
- A competitive export selling price for Niger at USD 564 per ton in 2016²⁰
- Only 15% of production consumed in Niger, leaving the country with an exportable surplus of ~1 million tons²¹
- The largest area harvested in Africa, estimated at 5.18 million hectares in 2017²²
- Farmgate price per ton was USD 119 in 2016, which is USD 53 cheaper than in Nigeria²³

There are some challenges in the cowpea value chain that affect its readiness for commercial investment. These include the cowpea's vulnerability to insects such as weevils when stored for more than six months and its associated high rates of post-harvest loss (10%).²⁴ Government programs, including I3N, have been put in place to improve cowpea storage capacity among farmers through training programs in efficient storage techniques and the introduction of PICS storage bags.

In terms of commercial viability, cowpeas have a competitive retail price, but Nigerian players can capture more margin in Nigeria with additional grading and storing. The wholesale price in Nigeria is at USD 970 per ton, which is USD 406 more expensive than Niger's export selling price.²⁵ Nigerians are willing to pay higher prices for cowpeas, especially if the product is sorted and well-packaged.²⁶ Niger is also well-positioned to export to Nigeria given that it can supply Nigeria at a lower price than competitors (see figure 8).²⁷

Cowpea export also has some margins 'internally' that increase the viability of a value-addition business – if an exporter can integrate vertically and capture some of the value that is in Niger's export price. There seems to be a strong opportunity to improve storage practices through use of proper storage bags,

Figure 8: Cowpea retail price comparison



¹⁹ Tridge, Cowpea import Nigeria, 2016; P.M Kormawa et. Al, Cowpea demand and supply pattern in Nigeria, 2018

²⁰ Food and Agriculture Organization, FAOstat, 2016

²¹ RECA, Axes de compétitivité de la filière niébé au Niger, 2011

²² FAO, FAOstat, 2017

²³ FAO, FAOstat, 2016

²⁴ PRODEX, Plan d'actions de la filière niébé, 2010

²⁵ FEWS Net, Nigeria price bulletin 2017

²⁶ Rabirou Kassali, Analysis of consumer's WTP for cowpea varieties in Osun State Nigeria: the hedonic pricing approach, 2018; CGIAR, Grain legume consumption patterns and demand, 2016

²⁷ Food and Agriculture Organisation, FAOstat, 2017; ITC, ITC Trademap databank, 2017; Chambre des commerces et de l'industrie du Niger, Note économique du Niger, 2018 ; FEWS Net, Nigeria price bulletin 2017

which can help increase volume of cowpeas sold at minimal additional cost by offsetting post-harvest losses.

4.2.2 ONIONS

Niger can increase its market share in the regional onion market given strong competitiveness in yield and cost of production. There has been strong global demand for onions of 7 million tons per year, growing 3% annually over the past ten years, and growth in West Africa is even higher at 15% per year.²⁸

The strong reputation of Niger's Violet de Galmi variety in the region presents a robust opportunity to build onion exports, with a 16% increase in export value from 2016 and an average export selling price of USD 760.²⁹ Other indicators of Niger's strong competitiveness in the onion value chain include:

- Top exporting country of West Africa and 2nd exporter into West Africa³⁰
- 9th highest yield in the world and 1st in Africa³¹
- Onions are produced at half the cost of production of Burkina Faso, the only other net exporter in ECOWAS³²
- Niger produces high quality onions that match regional taste preferences, but there is competition from lead exporter into West Africa, the Netherlands, which has a lower price point for its onion exports linked to the lower alignment to taste preferences³³

The significantly high levels of post-harvest loss (30% of production for Violet de Galmi) due to insufficient storage is a major constraint to the profitability of onions and would be a key concern to potential investors. Post-harvest loss is estimated at 170,000 tons per year on average and producers miss earning USD 180 per ton lost.³⁴ Capturing a portion of that loss can increase the profitability of onion production and export. There are, however, onion varieties produced in Niger that have much lower post-harvest losses – including the Blanc de Gotheye (1% loss rate), which is an ideal variety for onion powder processing.³⁵

4.2.3 MEAT

Efficient meat production units can increase Niger's competitiveness to supply both local and regional markets. There is strong demand for meat in Niger, estimated at an average per capita of 17.2 kg, one of the highest in West Africa, and growing demand in the region.³⁶ Key advantages that support Niger's competitiveness in meat production include:

²⁸ ITC, ITC Trademap databank, 2017

²⁹ ITC, ITC Trademap databank, 2017 ; Vieri Tarchiani et al, The onion sector: comparative study between Niger and Benin, 2011 ; Inessa Napo, Etude diagnostique de production de l'oignon dans la province du Yatanga, 2013 ;

³⁰ ITC, ITC Trademap databank, 2017

³¹ FAO, FAOstat, 2017

³² Vieri Tarchiani et al, The onion sector: comparative study between Niger and Benin, 2011 ; Inessa Napo, Etude diagnostique de production de l'oignon dans la province du Yatanga, 2013 ;

³³ ITC, ITC Trademap database, 2017 ; RECA, Oignon – un match entre le Niger et la Hollande, 2010 ; Réseau Africain pour le Développement de l'Horticulture, Formation de la qualité dans la filière oignon en Afrique de l'Ouest

³⁴Projet de Développement des Exportations et des Marchés Agro-sylvo-pastoraux, Plan d'actions filière onion Niger, 2008

³⁵ Réseau National des Chambres d'Agriculture, L'autre oignon du Niger

³⁶ Hannah Ritchie et. Al, global meat and seafood consumption, 2017

- Well-reputed meat in the region, demonstrated by its strong positioning in the live circuit export.
- Regional export opportunities to Benin, Côte d'Ivoire and Ghana, which represent 72% of ECOWAS meat imports³⁷
- Among top 30 countries in the world and 2nd in ECOWAS with the most livestock
- The meat production capacity of Nigerien cattle is high compared to other cattle in the region, with top species producing 48-52% meat vs. byproducts³⁸
- Niger meat's local wholesale price is at USD 694 and can gain a margin of USD 182 if exported to Nigeria^{39,40}

There are also some significant constraints to the meat industry in Niger, including the lack of coordination among dispersed actors in the value chain. Meat production is hampered by the absence of high-capacity and hygienic abattoirs and enabling transport and storage infrastructure. There is insufficient cold chain infrastructure and unreliable energy access to support emergence of chilled meat products at scale in the domestic market. There are also limited pathways to ensure the traceability and phytosanitary standards of meat products for export. These challenges would need to be addressed for meat production to take off in the country.

In terms of commercial viability, Niger can feasibly serve regional markets where it has trade access. While Nigeria currently has an import ban on meat, Côte d'Ivoire, Gabon, and Ghana have high and growing meat consumption. On price, Niger can beat South Africa in these destination markets. Though South Africa is a leading exporter of meat to the region, it exports at USD 6,583 per ton, and Niger can profitably sell quality chilled boneless meat to the market for just USD 3,632 – 55% of the South African price.⁴¹

4.2.4 DAIRY

Local demand of milk and dairy products can be captured through increased production capacity. The local demand for milk and dairy products is estimated at 61 liters per capita or a national demand of over 1 billion liters, but there is insufficient milk production, leading Niger to import both fresh and powdered milk.⁴² There have been gains in local milk production that indicate its market potential:

- Increase in production by ~5% per year between 2011 and 2017⁴³
- Increase in export market share for concentrated milk and cream in West Africa from 1.1% in 2001 to 26.7% in 2017⁴⁴
- Potential to increase production further with an average yearly production of 330 liters per lactating bovine (estimated at 15% of the cattle population)⁴⁵

Figure 9: Milk product price comparison local vs. imported

³⁷ ITC, ITC Trademap database, 2017

³⁸ Abdoulaye Bahari, Etude de la commercialisation de la viande rouge dans la communauté urbaine de Niamey, 2011

³⁹ FAO, Review of the livestock/meat and milk value chains and policy influencing them in Nigeria, 2016; Abdoulaye Bahari, Etude de la commercialisation de la viande rouge dans la communauté urbaine de Niamey, 2011

⁴⁰ It is important to note, however, that Nigeria currently has an import ban in place for meat products.

⁴¹ ITC, ITC Trademap database, 2017

⁴² Actions Intégrées pour un Développement Durable, Etude du marché des produits laitiers 100% Nigériens à base du lait local, 2016

⁴³ ITC, ITC Trademap database, 2017

⁴⁴ Ibid

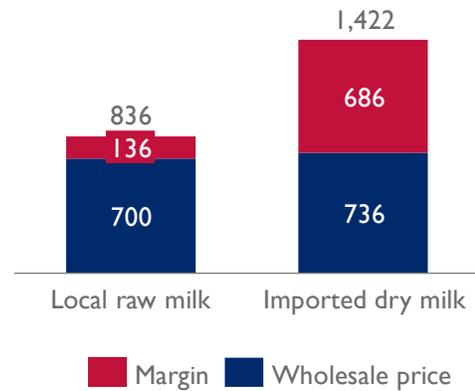
⁴⁵ AIDD, Etude du marché des produits laitiers 100% Nigériens à base du lait local, 2016; Yahoussa Gambo et. Al, value chain performance in the Niamey Dairy region, 2018

- One local breed, the Azawak zebu, can produce up to 10 liters per day, compared to 3.5 liters for other breeds in the region⁴⁶

The key challenge facing the local milk industry is the import of cheaper milk products and the high cost of processing of local milk. Local raw milk has a higher cost of processing compared to imported milk and is also further constrained by the lack of cold chain infrastructure and unreliable electricity access. Raw milk also has a high rejection rate of 17-30% for quality defects by processing units, which further constrains the supply chain.⁴⁷

In terms of commercial viability, local raw milk has less value in the local market sold at USD 836 per ton compared to USD 1,422 per ton for imported dry milk in 2016, and so also has lower margins for producers and dairy processors.⁴⁸ In addition to these constraints, dairy consumption contracted by 5% in recent years.⁴⁹ Taking these trends into account, the dairy sub-sector in Niger will not be viable in the short-term for commercial investment.

Retail price of milk products (USD)
Per ton



4.2.5 HIDES, SKINS, AND LEATHERS

Niger's thriving livestock sector offers great potential to develop the hides, skins and leather industry. There has been sustained and expanding global demand for skins in the wet blue stage and Niger has the potential to respond to local and regional demand for processed hides and skins given that processed reimports from Nigeria and Europe represent 80% of the value of raw hides and skins exported to Nigeria.⁵⁰ The key advantages that support Niger's competitiveness in hides, skins and leathers are:

- 2nd largest population of livestock in West Africa
- 80% of skins and hides collected are exported to Nigeria, India, Bangladesh, and Italy⁵¹
- High quality of Niger's Maradi red goat internationally recognized in the luxury leather industry⁵²

The industry is beset by challenges, as most of the tanneries in the country have closed, and the sector has been reduced to the collection and export of raw materials by informal operators. There are only two formal private tanneries supplying semi-final products for export. There is also strong competition from tanneries in the north of Nigeria, which import raw hides and skins and benefit from the high volume of animals slaughtered locally as compared to Niger.⁵³

⁴⁶ Ibid

⁴⁷ Ibid

⁴⁸ ITC, ITC Trademap databank, 2017

⁴⁹ AIDD, Etude du marché des produits laitiers 100% Nigériens à base du lait local, 2016

⁵⁰ Ministère du Développement Agricole, Etude sur la compétitivité des filières viandes rouge/cuir et peaux, 2008

⁵¹ ITC, ITC Trademap databank, 2017

⁵² Programme de Productivité Agricole en Afrique de l'Ouest, The Red Goat of Maradi: the 'dairy cow' of the poor, 2016

⁵³ Ministère du Développement Agricole, Etude sur la compétitivité des filières viandes rouge/cuir et peaux, 2008 ; Abubakar Sambo Junaidu, Export performance of SMEs in the Nigerian leather industry and the mediating effect of perception of export difficulty, 2012

The government has plans to further invest in the intensification of livestock farming, which will help to increase collection of animal skin for leather production. However, there is a need to support the entire livestock value chain for a viable leather industry or business to emerge. For example, the local artisanal leather market struggles to source high quality supply. Increased hides and skins collection and quality are greatly dependent on the performance of the entire value chain (slaughtering, animal health, etc.).

In terms of commercial viability, margins on products from processing raw skins can be up to USD 2 to 7 per skin⁵⁴ depending on the quality of processing, the destination market, and the tannery's ability to source directly from an abattoir – margins increase if the businesses are linked.

4.2.6 MORINGA

Global moringa trade is expected to reach USD 8.2 billion by 2020 with a projected annual growth rate of 9%.⁵⁵ Most of that growth is led by strong demand in countries that do not have the comparative climatic advantage to produce the tree, which provides an opportunity for countries like Niger to produce moringa for export. Niger can increase its share of global exports by targeting niche markets attracted by organic production and the potential to sustainably source from a developing country. In addition, there is high local demand and consumption of moringa. Niger has the following competitive advantages in moringa:

- Organic moringa production, as only 1 in 3 moringa producers use chemical fertilizers
- Farmgate price is USD 134 per ton with an average production cost of USD 76 per ton, such that margins are 43% over farmgate.⁵⁶ This is in part due to the relative affordability of fresh moringa for local consumption

The key challenge that limits the viability of moringa is the small scale of production, which does not lend itself to commercial scale processing activities.⁵⁷ Moringa is also mainly produced during the rainy season, so there is little off-season production. Moringa provides livelihoods for just 2,000 Nigeriens, though there is potential to create more jobs if production and transformation activities are expanded.

In terms of commercial viability, the base margins on moringa are attractive for potential businesses but are thinner once processing and transport costs are considered for reaching a scale of operations that is enough for export.

4.2.7 ARTISANAL GOODS

Niger has an established reputation for finely-crafted leather goods and jewelry that can develop a niche export market. The sector is the second largest contributor to the employment of Nigeriens, with close to 900,000 jobs – though most are in the informal sector.

There are a few positive trends in Niger:

⁵⁴ Ministère du Développement Agricole, Etude sur la compétitivité des filières viandes rouge/cuir et peaux, 2008

⁵⁵ Advanced Biofuel Center, Moringa value addition business plan, 2017; Yeeray Savedra and Edwin Van Der Maden, Opportunities for the development of the moringa sector in Bangladesh, 2015

⁵⁶ RECA, Note sur la variation du prix du Moringa à Maradi, 2011

⁵⁷ Yeeray Savedra and Edwin Van Der Maden, Opportunities for the development of the moringa sector in Bangladesh, 2015

- The market is growing: Export of creative goods grew by an average annual rate of 18% between 2010 and 2014, with 83% absorbed by the regional market and 10% by Europe⁵⁸
- USD 100 spent on average by tourist on Nigerien handicrafts, with foreign visitors growing annually by 8% from 2012 to 2016, although tourism has been affected by growing regional insecurity⁵⁹
- Strong knowledge and skills base developed from a long tradition of artisanal craft making
- Potential to increase access to quality inputs, especially for leather

For Niger to expand its reach in regional markets, the quality of artisanal products would need to improve. Actors have difficult accessing quality inputs and aggregating enough quantity of quality supply, which is exacerbated by the high informality of the sub-sector.

4.2.8 SOLAR ENERGY

There are opportunities to improve Niger's energy mix with investments in solar energy. Most of the population (88%) has no access to electricity and current energy generation covers less than 20% of need. Most electricity consumed (81%) is imported from Nigeria and installed capacity stands at just 8 MW, with government plans to increase the country's use of solar to 100 MW.⁶⁰

Key advantages supporting Niger's competitiveness and viability in solar include:

- One of the top sunniest areas globally and large land surface which can be exploited for solar energy⁶¹
- Average insolation level at 8.5 hours per day and 300 sunny days a year⁶²

A total solar power capacity of 100 MW can generate 146 GW and ~300 jobs per year (200 direct and 100 indirect). To increase the chances for Nigeriens to capture these jobs, investment in training would be needed.

Given the strong willingness of the government to promote on-grid solar energy, the initial competitiveness analysis explored opportunities for on-grid. The challenge is that there is not yet a framework in place for energy actors to engage with government – each PPP is structured independently. Furthermore, prices are dependent on the negotiating power of a small pool of actors, given private producers' restricted ability to only sell to NIGELEC and private companies. This creates a riskier venture for potential investors, who would need to assess feasibility, conduct due diligence, and finally negotiate well enough with the government to get an attractive deal. Investors will be able to more reliably contribute to PPPs once a framework is in place.

In place of further exploring on-grid solar options (which, as mentioned above, are dealt with on a case by case basis), the study shifted towards further exploration of opportunities in off-grid solar that would allow for catalytic impact for those households without electricity access.

⁵⁸ Data is inclusive of export of creative services which however constitutes a very minimal part of total exports according to a 2015 UNCTAD report. United Nations Conference on Trade and Development, Creative Economic Outlook, trend in international trade in creative industry 2002-2015, 2018; UNCTAD, Creative Economic Outlook, 2015

⁵⁹ Institut National de la Statistique, Tableau de bord social, 2016

⁶⁰ World Bank, World Bank help to Increase Access to Electricity in Niger, 2015

⁶¹ The Guardian, The sunniest spots in the world, 2014

⁶² Ibid

For off-grid, there is sufficient margin on the solar home system products to make them a viable investment and to further explore the opportunity. The average energy cost per kWh for a Solar Home System is USD 0.46 compared to USD 0.16 for the grid electricity.⁶³ This does not account for the need for maintenance but can still potentially be an interesting offer in areas without grid access or alternative energy sources. The price per kWh is higher than the on-grid options, but products for household use are more likely to be installed in areas where there is no access to the grid.

4.2.9 TRANSPORT

Niger is reliant on the transport services sector given its landmass, dispersed population and geographic distance from regional markets. Niger has seen annual growth of close to 5% from 2013 to 2017, driven by increased movements of people and goods. The transport sector is the third largest contributor to the services sector. The vast majority (95%) of the total freight in Niger is carried by road with an obsolete vehicle fleet.⁶⁴

In 2014, transport was already providing more than 48,000 jobs. The same year, the Guichet Unique Automobile du Niger created 260 direct jobs and 2,600 indirect jobs.

While there is need in the market for lower cost transport services, Niger is not well-positioned compared to other countries in the region to meet this need. Only 32.5% of Nigerien export-import freight is carried by Nigerien-owned vehicles, most of which are organized into a professional association which regulates prices.⁶⁵ Inland transportation costs make up 40-60% of the price of lower value commodities and 30-50% of the price of higher value commodities, and this percentage is higher in the Niamey-Cotonou corridor, which registers the highest hidden cost paid per ton among the West African corridors.⁶⁶ This limits the competitiveness of Nigerien export-import freight owners to capture demand when compared to regional or international companies, which have the advantage of connecting to more destinations and typically have larger fleets. Furthermore, Niger has a lower logistics performance rate (2.0 out of 5) compared to other West African countries such as Côte d'Ivoire (2.89) and Benin (2.65).⁶⁷

In addition to the price-setting, the local market is also characterized by high risk and costs for transport companies, which operate on thin margins and limited cash flow. The regulatory framework also constrains market entry for actors involved in transporting their own goods from providing services to other companies – for example, the Dangote Cement truck fleet cannot carry products for other companies.

4.2.10 ICT

Niger's smart villages project presents opportunities to invest in telecommunications infrastructure and services. There is USD 45 million needed for PPP investments in telecommunication infrastructure and services in line with the government plan to digitally connect around 15,000 villages and 85% of the population.⁶⁸

⁶³ Open Capital Advisors, Niger Off-grid solar market assessment, 2017

⁶⁴ Ministère des transports, Annuaire statistiques 2012-2016, 2016

⁶⁵ Institut National de la Statistique au Niger, ENISED, 2016

⁶⁶ Nathan Associates Inc, Logistics cost study of transport corridors in Central and West Africa, 2013

⁶⁷ World Bank, World Bank logistic performance index survey, 2017

⁶⁸ World Bank, Smart Villages for rural growth and digital inclusion (PI67543), 2018

Digital infrastructure is perhaps the strongest opportunity. Niger's licensed telecoms infrastructure provider Eaton Towers quadrupled its revenue from 2013 to 2017 compared to the much slower growth in the broader ICT sector (1%).⁶⁹

The sector provides 2,000 formal jobs, 50% of which are covered by one operator.

Some of the challenges affecting the ICT sector include:

- High mobile prices representing 33% of GNI compared to 14% in Africa, thus limiting use of telecoms services⁷⁰
- Low population density that can limit commercial viability of telecommunication infrastructure

4.2.11 SHORT-LISTED SUB-SECTORS

The four short-listed sub-sectors included:

- **Cowpeas:** Moderate margins on sorted, packaged product for export and widespread production to allow for an out-grower scheme that allows farmers to earn an additional USD 300-450 per hectare. The IRR is estimated at 26%, but is a conservative estimate based on market price whereas interested buyers will likely offer better returns.
- **Meat:** Modern abattoir that produces substantial margins depending on destination market and buyer relationships. There is an opportunity to further gain earnings through processing of by products, skins, and hides. The meat sub-sector offers a potential IRR of 32%.
- **Onions:** Processing the Blanc de Gotheye variety into onion powder offers a potential IRR of 24%, accounting for the cost needed to secure supply for a 2,000-ton processing unit. Margins are much thinner on the aggregation and export of Violet de Galmi variety with an IRR of 6% but is a relatively small-scale operation.
- **Solar:** PAYG model provides additional opportunity to reach base of the pyramid customers, but there are low margins on each product given the need to price for affordability and the high cost of importing solar products. The IRR is estimated at 12%.

⁶⁹ GSMA, The economic impact of telecommunication in Niger, Digital inclusion and mobile taxation in Niger, 2017

⁷⁰ Ibid

5. INVESTMENT CASES

Each business case outlined in this report was analyzed following a five-part framework, which allowed for an assessment of the ideal positioning, structure, and support needed for a business to operate in the selected sub-sector:

- **Market opportunity:** Analysis of business opportunity based on existing demand, Niger's competitiveness, feasibility and existing support services or initiatives
 - **Business activities:** Overview of the business activities, scale of operations and learning from relevant benchmarks in the region and beyond
 - **Business model financials:** Initial financial analysis to evaluate the investment needs, costs, revenues and potential returns
 - **Impact potential:** Estimation of the potential social impact created by the investment, in terms of employment and incomes
- Support required:** Details of the potential government and partner support that can reinforce commercial viability or help to attract investors

A financial model based on the business case was developed for each commercial opportunity and serves as the basis for the figures reported for returns on investment.

5.1 MEAT

5.1.1 MARKET OPPORTUNITY

Global beef consumption is growing at 0.9% per year and was 9.6 kg per capita in 2017.⁷¹ The Middle East and North Africa are the largest food-importing regions in the world with the Gulf Cooperation Council meat imports reaching USD 4.4 billion in 2016. Meat consumption in sub-Saharan Africa is projected to grow 2.4% per year up to 2025 and it is estimated that 38% of the increased consumption will be met by imports and the remaining from increased domestic or regional production.⁷²

With over 43 million heads of livestock in 2017, Niger is among the top 30 countries in the world and the 2nd highest producer of livestock in West Africa. The Nigerien cattle sector has potential with 14 million heads of cattle and exports of over 120,000 live animals in 2017, growing at an average of 27% per year.⁷³ Livestock comprises as much as 15% of overall GDP (exclusive of agriculture) and contributed nearly 12% of export revenues in 2017.⁷⁴

Niger can be price-competitive in Côte d'Ivoire, Gabon, Saudi Arabia, and the United Arab Emirates, given the relatively high retail prices for chilled boneless meat and growing demand. Niger is home to animal species that can fetch high prices for meat and leather in international markets. Côte d'Ivoire and Gabon

⁷¹ Hannah Ritchie et. Al, global meat and seafood consumption, 2017

⁷² Organisation for Economic Co-operation and Development and Food and Agriculture Organisation, Agriculture in Sub-Saharan Africa: Prospects and challenges for the next decade, 2016

⁷³ FAO, FAOstat, 2017

⁷⁴ Chambre de commerce et de l'industrie du Niger, Note économique, 2018

are attractive regional markets because they have seen high growth in recent years (13% and 20% respectively), and offer interesting margins given the relatively high average import prices for meat (USD 11 and 9 respectively). Saudi Arabia and the UAE are seeing more moderate growth (7% and 8%) but are importing large volumes of meat annually which can still be captured by new players (20,000 tons and 39,000 tons respectively).⁷⁵

Figure 10: Market characteristics and opportunities for meat export

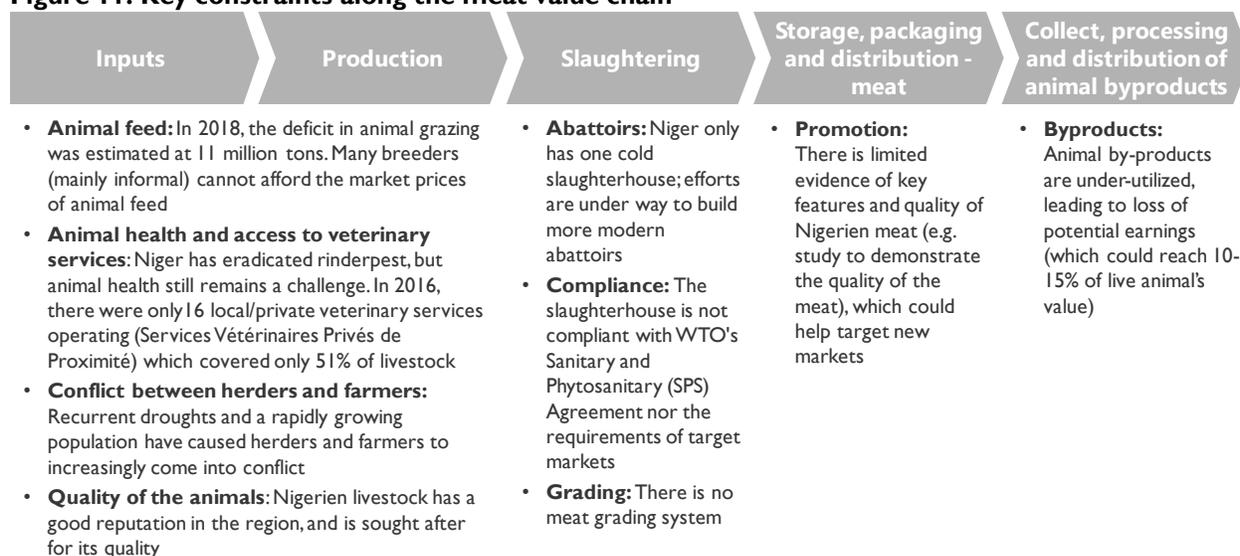
Countries	Market characteristics (from 2013 to 2017)	Niger's competitive play
 <p>Côte d'Ivoire</p>	<ul style="list-style-type: none"> • Volume: 82 tons per year • Growth rate (2013-2017): 13% • Import price per kg: USD 12 - average price 11.2 	<ul style="list-style-type: none"> • The existence of regular flights between Niamey and Abidjan is an asset for Niger's chilled, boneless meat. Niger's meat has also a strong reputation in Côte d'Ivoire (PRODEX, 2008). Niger can sell quality meat at a lower price than the imports from France to be competitive
 <p>Gabon</p>	<ul style="list-style-type: none"> • Volume: 400 tons per year • Growth rate (2013-2017): 20% • Import price per kg: USD 9 - average price 	<ul style="list-style-type: none"> • South Africa exports meat to Gabon at a price of USD 11.4 per kg. However, Niger could sell at a price as low as USD 9 per kg in that market and still make a profit
 <p>Saudi Arabia</p>	<ul style="list-style-type: none"> • Volume: 20,000 tons per year • Growth rate (2013-2017): 7% • Import price per kg: USD 5-24 with an average price of USD 6 	<ul style="list-style-type: none"> • Niger can focus marketing efforts on its strong reputation of high quality meat, and sell at USD 14 per kg (20% less than the price of Canadian chilled boneless meat in Saudi Arabia)
 <p>UAE</p>	<ul style="list-style-type: none"> • Volume: 39,000 tons per year • Growth rate (2013-2017): 8% • Import price per kg: : USD 2-29 with an average price of USD 7 	<ul style="list-style-type: none"> • Niger can seek to export special meat cuts (such as ram steak) which is highly valued by affluent UAE consumers that are willing to pay 2-3 times higher for those cuts

5.1.2 VALUE CHAIN OVERVIEW

The building blocks for the meat value chain are in place, but recapturing markets requires that certain constraints that drive up costs and limit traceability be addressed.

⁷⁵ ITC, ITC Trademap databank, 2017

Figure 11: Key constraints along the meat value chain



Source: PRODEX, Plan d'actions filière onion Niger, 2009; SNV, Importance de l'oignon au Niger; Stakeholder interviews; Dalberg analysis 2019

5.1.3 SPOTLIGHT ON POTENTIAL INVESTMENT

Investing in the production and export of meat and byproducts offers a potential IRR of 32% over 10 years. The opportunity depends on the anchor having reliable access to high quality meat-producing animals. The case focuses on the sale of chilled, boneless meat sold and exported to target markets at competitive prices, with an opportunity to also capture value from meat byproducts. The investment in the production and export of meat and byproducts will involve the following key activities:

- Sourcing animals from a livestock farmers' organization (such as Fédération Nationale des Eleveurs du Niger), and fattening them for 60 days to increase yield and meat quality
- Slaughtering animals, followed by cutting, boning and packaging of meat
- Exporting boneless, chilled meat by airfreight to Côte d'Ivoire and Gabon from year 1, UAE from year 3, with expansion to Saudi Arabia from year 5

Financial snapshot for a modern abattoir

Investment required	• Approx. USD 3.7 million including initial capital required to set up an abattoir with a fattening unit
Average sales (volume)	• 550-650 MT of boneless meat per year
Average Sales (value)	• USD 6 million on average, including USD 330K from byproducts
IRR	• 32% over 10 years

+ High-level estimate for hide & skin processing

Investment required	<i>Hides and skins processing unit as part of the abattoir would likely cost approx. USD 150,000, including the leather processing equipment and additional operating costs, salaries and inputs</i>
Average sales	<i>6200 cow leather skins and 4900 goat leather skins per year projected to be processed and sold</i>
Average sales (value)	<i>USD 190,000 per year on average</i>
IRR	<i>20-25% over 10 years</i>

Potential anchor for the investment

A specific skillset will be needed for the anchor to produce and export of meat and byproducts that meet international standards for quality and safety – from the input sourcing to end-product distribution. Thus, an ideal anchor would:

- Be a current actor in the meat production field
- Have experience in meat production techniques with the required quality and hygiene standards to export to international markets
- Be able to effectively source quality animals in Niger (i.e., through partnerships with livestock farmers' associations and veterinary service providers)
- Exhibit the ability to fatten and raise animals with the required care
- Have existing commercial ties with buyers in international markets and exhibit the capacity to distribute to these markets via partnerships with cold chain logistics service providers and airlines
- Demonstrate a strong understanding of the risks and opportunities involved in livestock product value chains for the breeder and the broader ecosystem
- Establish strong partnerships with government and donors to enhance Niger's competitiveness in the global export of meat and byproducts

Business model financials & Investment structure

The investment will require an initial capital of approximately USD 3.7 million which includes the costs incurred in setting up the modern abattoir with a projected maximum annual capacity of 2000 tons of production per year and the equipment and required health, ISO, and Halal certifications to be able to access the target markets. In year 1, the business' operating costs are estimated at USD 1.5 million and USD 4 million by year 10 with working capital of USD 640,000. This includes costs incurred in breeding (for the goats), fattening (for the cattle), slaughtering and packaging, branding, marketing and distribution as well as salary and other administrative payments.

The average total operating costs for the ten-year period is estimated at USD 3.3 million, along with a projected average gross margin of USD 2.7 million that would require an average additional working capital of USD 71,000 each year to expand activities.

The project is most likely to obtain financing either through commercial actors (where some portion of finance is in the form of bank loans) or profit-sharing with a buyer in a destination market (where the buyer pre-finances some of the abattoir costs in return for a portion of revenues). The business would also be eligible for accessing low-interest finance through the Fonds d'Investissement pour la Sécurité Alimentaire et Nutritionnelle (FISAN) once it is operational.⁷⁶

Potential risks

There are some risks related to running such a business in Niger, largely related to challenges with access. Interested businesses and investors would need to explore mitigation strategies to attenuate those risks, including:

⁷⁶ FISAN is the Investment fund for food security in Niger. It is an initiative of the Government of Niger which aims to improve access to financial services for all actors in agricultural value chains to support the processing and access to markets of agricultural products (including livestock and fishing activities)

- **Managing access to animal feed and volatility in prices:** Local animal feed production is insufficient to meet demand, with prices that increase by more than 3x depending on the period of the year. The business can stock up on animal feed between January and May when prices are at their lowest or develop partnerships with local animal feed producers to ensure a sizeable off-take in exchange for competitive feed prices.
- **Ensuring a consistent supply of healthy targeted animals:** Only 51% of livestock are covered by veterinary services. There are also difficulties in gathering animals weighing above 200 kg because of lack of coordination among breeders. The business can build partnerships with breeders' organizations that are supported by programs such as Veterinarians Without Borders (VSF). Another mitigation opportunity would be to invest in an in-house veterinary team that will assess health of animals pre-purchase.
- **Gaining access to cold chain support:** There exist only a few cold chain transport suppliers that also serve other refrigerated products. However, there are opportunities to negotiate long term contracts with existing cold chain transport suppliers, or to invest in cold chain containers that can be managed by a transport partner.
- **Identifying and accessing other attractive markets:** The breeding system in Niger is traditional and does not comply with traceability requirements in more stringent markets. The business can gradually extend activities to in-house animal production or partner with government and donors in structuring traceability system implementation strategy.

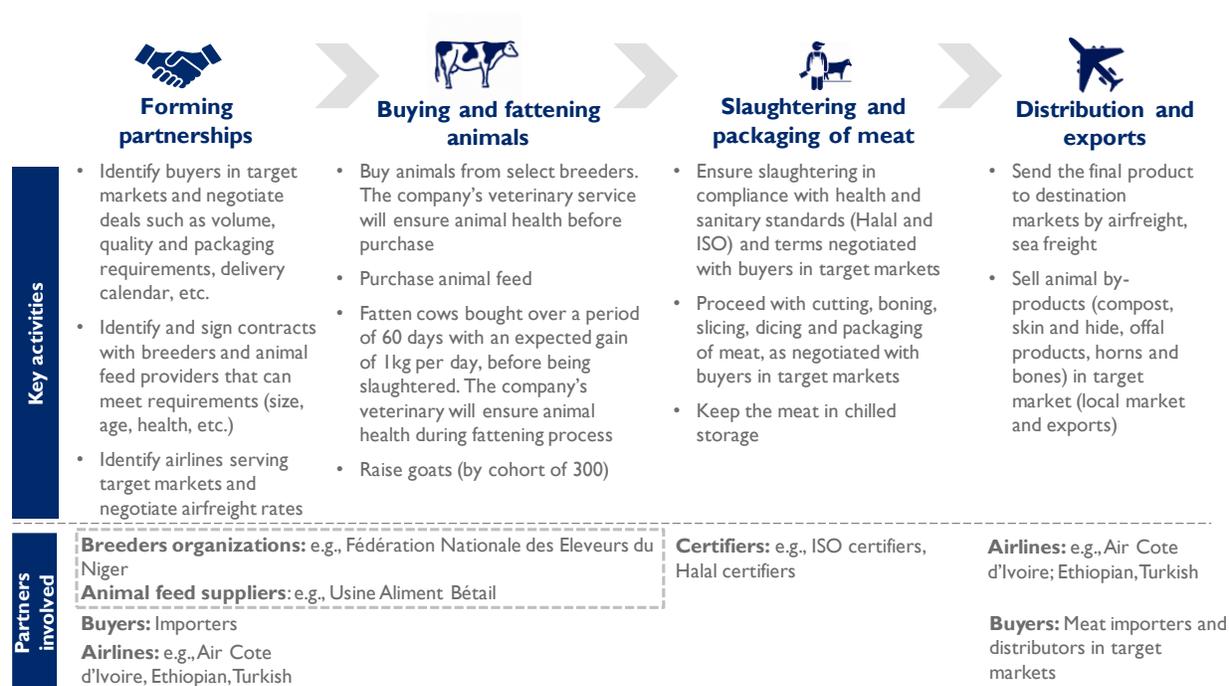
Support required

The success of this investment is strongly dependent on key partners such as:

- Breeder associations that could reliably respond to demand of healthy animals, e.g., Association des Eleveurs du Niger
- Animal feed suppliers that could supply the required amounts of animal feed, e.g., Usine Aliment Betail
- Cold chain logistic service providers that could transport end-product from abattoir to airport, e.g., Bollore logistics
- Airlines that provide connections to target markets, e.g., Ethiopian Airlines, Turkish Airlines, Air Côte d'Ivoire
- Meat import and distribution units in target markets that the business could supply following already established terms and conditions

Figure 12 outlines the actions the anchor will need to take to secure these partnerships that can help improve margins or otherwise facilitate the export of meat out of Niger.

Figure 12: Key actions to secure partners for meat production and export



Financial / grant support

Access to the right financing instruments will also be key to unlocking the success of this business. The different pathways identified include:

- **Supporting concessional debt financing instruments:** Introducing a funding window with concessional loans could encourage new entrants to take on the risk of revitalizing Niger's meat exports to serve more stringent but attractive markets. The research did not identify the use of such instruments for other projects in Niger, so it would be worth exploring the viability of such a financing instrument in the Nigerien context.⁷⁷
- **Structuring deals with buyers:** Striking deals with target buyers to pre-finance production at the desired quality level could be explored as another financing option. The business would need to first demonstrate its ability to meet a buyer's terms and conditions through a due diligence process or through a past trade relationship. To incentivize this type of deal, the buyers could be provided access to financing that lowers the cost of capital for the project.

Technical assistance

Access to capital should also be paired with a technical assistance that would strengthen the competitiveness of the business in international markets. Such technical assistance could come in the form of:

- **Strengthening access to markets:** Accessing destination markets is a critical area that would benefit from further support – and particularly on improving the traceability of meat across the industry. Niger's market access is limited due to the high bar set on meat quality standards in

⁷⁷ AviNiger, an upcoming actor in the livestock industry, received an investment from Bio-Invest that was structured using a debt instrument, along with a subsidy for technical assistance

most markets. Government can help businesses by negotiating trade deals that promote and support Niger's meat production and by investing in the promotion of Nigerien meat to increase competitiveness.

- **Improving traceability:** There is greater need for trade agreements and capacity building for producers to become more aware of the import requirements for destination markets and to better comply with more stringent quality standards. Technical support can help strengthen the anchor's ability to comply with quality and safety requirements in target markets, especially in the Gulf countries where requirements are more stringent than the local market. Donors and government can also set up a fund or otherwise direct funding towards increased compliance of local breeders and meat producing units, with a first focus on building an easily replicable traceability system.

Value Chain strengthening

There are also opportunities for government and donors to play a role in improving upstream animal production to mitigate some of the risk an abattoir faces in sustainably sourcing meat for export:

- **Strengthening animal health services provision:** Improved animal health services would improve the bottom line for all in the value chain, as Niger has had difficulty enforcing animal health norms due to the high informality of the sector. Government and donors can support convening platforms between breeders' organizations and veterinary service providers to encourage greater uptake. More work can be done to diversify the supply of quick, accessible, affordable animal health solutions for breeders (e.g., through mobile technologies).
- **Promotion of local animal feed production:** Promoting local feed production would also help improve margins for livestock farmers, fattening units, and abattoirs. Animal production is hampered by the limited access to cost-effective animal feed; almost all animal feed is imported. Government and donors can consider establishing dedicated zones for animal feed production, with short- or medium-term incentives (access to land, tax exemption, etc.) to encourage entry. Donors can facilitate better market linkages for actors involved in animal feed and fattening to create an attractive environment for animal fattening.
- **Capacity building of livestock farmers' organizations:** Government and donors can continue building capacity of livestock farmer and breeders' organizations to professionalize. Niger's livestock industry is dominated by intermediaries (many from neighboring Nigeria) that have taken advantage of the lack of coordination among livestock farmers in Niger. Government and donors can increase the capacity of livestock farmer and breeders' organizations to consistently supply local modern abattoirs and international private meat industry players through trade fairs, etc.

5.2 COWPEA

5.2.1 MARKET OPPORTUNITY

Given Niger's competitiveness in production costs, there is a strong opportunity to export cowpeas to the regional market, including Nigeria. Niger already captures 49% of the market for cowpea imports into Nigeria and is able to produce cowpeas at a farmgate cost per ton that is USD 53 cheaper than in Nigeria.⁷⁸

⁷⁸ Tridge, Nigeria cowpea import, 2017

Cowpeas are the most consumed grain in Nigeria, constituting 5.2% of food expenditure with an average consumption per household estimated at 5 kg, compared to 2 kg for other grains, and imports of 600,000 tons per year.⁷⁹ Exports from Niger have grown by 20% from 2013 to 2017 and are expected to grow further.⁸⁰

The Nigerian cowpea enjoys strong demand from Nigeria and Ghana. With a population of 200 million growing at an annual rate of 2.6%, the cowpea market in Nigeria remains an attractive destination market for Niger, that has shown steady growth over time. Ghana is the second trade partner, importing an annual average of 7,000 tons of cowpeas from Niger.

The fundamentals for strong retail positioning are already in place – consumers are sensitive to high quality cowpeas and willing to pay higher prices.

- A recent study conducted on randomly selected cowpea consumers and retailers by the department of agricultural economics of Osun State University in Nigeria confirmed that cowpeas with weevil damage tolerance, brown color, large grain size and short cooking time commanded a high price for almost all varieties. Consumers tended to discount prices for insect damage, small size, white color, smooth skin and grain color mixed together. This indicates a value-add potential in sorting, cleaning, grading and packaging cowpeas before export to Nigeria.
- A study led by CGIAR found that the food expenditure elasticity for cowpeas in Nigeria (1.05-1.06) indicated that consumers are less sensitive to price increase/decrease compared to the common bean in Uganda and the chickpea in Ethiopia. In Nigeria, cowpeas are the most widely consumed grain and has the highest price of staple food crops except for soybean and rice. Additionally, the growth rate of demand for this crop is expected to increase as income increases.

Consultation with a company in Nigeria confirmed that buyers are willing to pay a high price for products that comply with quality requirements. The buyer was willing to pay a 40-100% premium on the wholesale prices for a high-quality product (USD 700-1,000 per ton vs. USD 504 wholesale). The figure below outlines some of the key requirements for a Nigerian buyer, which include specifications about the color, quality, and storage practices.

Figure 13: Example of key requirements for cowpea buyer in Nigeria

Company's requirements	Aggregator's ability to deliver
<ul style="list-style-type: none"> • Requires white and brown varieties in medium and large-sized grains 	<ul style="list-style-type: none"> • Coordinating in advance with farmers • Sorting production
<ul style="list-style-type: none"> • Requires products that do not include broken or insect-attacked grains 	<ul style="list-style-type: none"> • Investments are made to decrease vulnerability to weevil attacks
<ul style="list-style-type: none"> • Willing to purchase between 1,000 to 3,000 tons in the first year with required sampling 	<ul style="list-style-type: none"> • Production capacity is estimated at 4,000 tons in the first year
<ul style="list-style-type: none"> • Willing to pay between USD 700-1,000 per ton for quality product – price must include logistics 	<ul style="list-style-type: none"> • Proposed price is higher than wholesale price (USD 504 per ton), indicating that the business can be even more profitable than estimated if supply is secured

⁷⁹ Rabirou Kassali, Analysis of consumer's WTP for cowpea varieties in Osun State, Nigeria: the hedonic pricing approach, 2018; P.M Kormawa et. Al, Cowpea demand and supply pattern in Nigeria, 2018

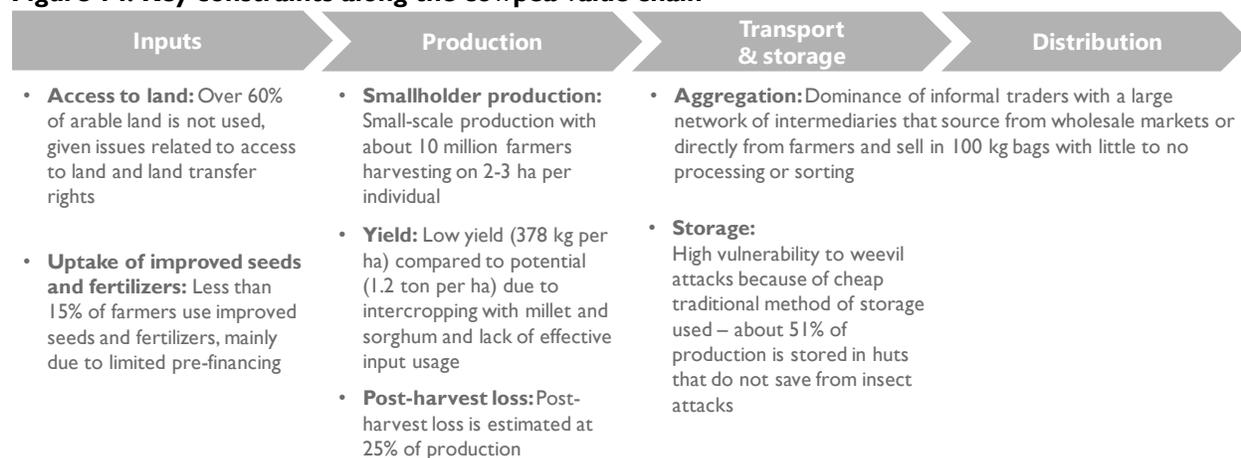
⁸⁰ Chambre de commerce et d'industrie du Niger, Note économique du Niger, 2018

5.2.2 VALUE CHAIN OVERVIEW

Cowpea production is well-established across Niger – it is grown as a cash crop by 10 million smallholders, but value is lost at key points in the value chain. Cowpea exports are already a sizeable industry, with 1 million tons exported per year.

Across the value chain, there are key opportunities to increase commercial returns by recapturing some of the value being lost by investing in better inputs, production practices, storage, and packaging.

Figure 14: Key constraints along the cowpea value chain



Source : UN-OCHA, Bulletin humanitaire Niger, Juin - juillet 2018, 2018; Global Agriculture, Land and water use in Niger, 2016; PPAO/WAAPP, Services Vétérinaires Privés de Proximité (SVPP), 2017

5.2.3 SPOTLIGHT ON POTENTIAL INVESTMENT

There is an attractive opportunity for an investment focused on aggregation and establishing strong business relationships and networks with farmers and buyers before seeking to integrate upstream through commercial production or out-grower schemes (inputs & production). There are potential returns of 26% over 10 years for a business model focused on cowpea aggregation and export. The opportunity would consist of 1) securing contracts with farmers and buyers in target markets and negotiating deals, 2) aggregating, packaging, and storing cowpeas, and 3) transporting packaged cowpeas to target markets.

The business case assumes that around 70% of production will be sold in Nigeria for USD 487 per ton (conservative estimate; prospective buyer quoted USD 1,000 per ton) and 30% locally at USD 570 per ton. The expected yield from partner farmers is projected to be around 550 kg per ha in year 1 and projected to grow to 850 kg per ha by year 10 with pre-financing of high-quality inputs.

The opportunity has the potential to create 140 direct jobs and improve the livelihoods of up to 6,000 farmers and their households over 10 years, with an increase of income per farmer of up to \$2,800 by Year 10.

Financial snapshot

Investment required	Approx. USD 3 million <i>includes land acquisition for the factory, construction (factory + warehouse), laboratory equipment, sorting and sizing machinery, and certification</i>
Number of partner farmers	2,800-3,000 smallholder farmers producing on 16,000 ha, with an additional 2,000 ha under production by year 10
Average sales (volume)	10,000-11,000 MT cowpeas per year on average
Average sales (value)	USD 5.6 million per year on average
IRR	26% over 10 years

Proposed location of the business



Potential anchor for the investment

Given that cowpea production is small scale, the business case requires efficient aggregation across a network of dispersed farmers for export to regional markets. A successful anchor for the investment would:

- Be a current actor in the agriculture sector
- Have a strong capacity for developing successful partnerships with farmers' organizations
- Have demonstrated ability to aggregate local agricultural production and access regional agricultural markets through established relationships with logistics service providers
- Develop commercial ties with buyers in international markets
- Demonstrate a strong understanding of the risks and opportunities involved in agricultural commodity value chains
- Have experience providing technical support to farmers

Business model financials & investment structure

The investment will require an initial capital investment of approximately USD 3 million which will include the costs incurred in setting up the factory and the warehouse, the equipment needed to efficiently sort and package and the ISO certification to vouch for the quality of production, all estimated at USD 650,000. The investment will also help launch operations with costs estimated at USD 2.4 million at the end of year 1 and USD 4.7 million by year 10. This includes cost incurred in production (starting from year 6), aggregation and transport to Niamey where the facility and warehouse would be located, sorting, cleaning and packaging, marketing and distribution costs to the Nigerian market as well as salary and other administrative payments.

The average total operating costs for the ten-year period is estimated at USD 3.7 million, along with a projected average gross margin of USD 1.9 million that would require an average additional working capital of USD 506,000 each year to expand activities.

Given the relatively small investment size, this project is likely to draw funding through commercial finance (in the form of bank loans). There could be opportunities for partners to provide adjacent support through technical assistance to facilitate the vertical integration of the business with farmers through farm training or capacity building of farmers' organizations. Following year 5, as the business transitions to an out-

grower scheme with inputs pre-financed and supplied by the business, there will be some contractual terms that need to be introduced to lessen the risk of issues such as farmer repayment defaults, high rates of post-harvest loss, etc.

Potential risks

The research highlighted potential risks, largely in line with securing access to a consistent supply of quality product, that will need to be mitigated to improve the business prospects.

- **Side-selling to intermediaries:** The biggest risk that a business involved in cowpea aggregation faces is that of farmers side-selling to intermediaries and affecting consistency of supply for the aggregator. As cowpea is grown in Niger as a cash crop, smallholder farmers use revenues generated from production to take care of their needs and may be tempted to sell production to the earliest or most convenient buyer. The business can mitigate this risk by aligning its purchase pricing with market prices and by building a reputation for reliably buying production. The business can also invest in strengthening relationships with farmers' organizations through complementary support such as training and consider providing access to inputs as those relationships solidify.

The more moderate risks that affect the business' bottom line are related to the production potential lost in the upstream value chain due to low yields and post-harvest losses.

- **Consistent access to high quality inputs:** Farmers lack access to high quality inputs, which – if applied properly – can increase yields by 40%. The supply and prices of these seeds present a challenge, so the business can consider supporting input supply. The support can be channeled through contracts with farmers' organizations that collaborate with development projects to have access to improved inputs or by strengthening the pipeline of pre-orders that can serve as a guarantee for input pre-financing.
- **Post-harvest loss due to insect attacks:** For post-harvest loss, cowpea is particularly vulnerable to insect attacks that can cause the loss of entire production in a span of six weeks. The business will need to manage insect attacks very closely and invest in PICS bag storage – potentially by selectively partnering with farmers that use PICS bags – for example, this would include about 60% of farmers in Maradi.
- **Establishing buyer relationships:** A more minor risk for the business will be to establish relationships with buyers that are interested in paying a higher price for pre-sorted, quality products. Some buyers in Nigeria may prefer to buy loosely sorted cowpeas directly from intermediaries in Niger, so some effort will be required to develop relationships with the right buyers.

Support required

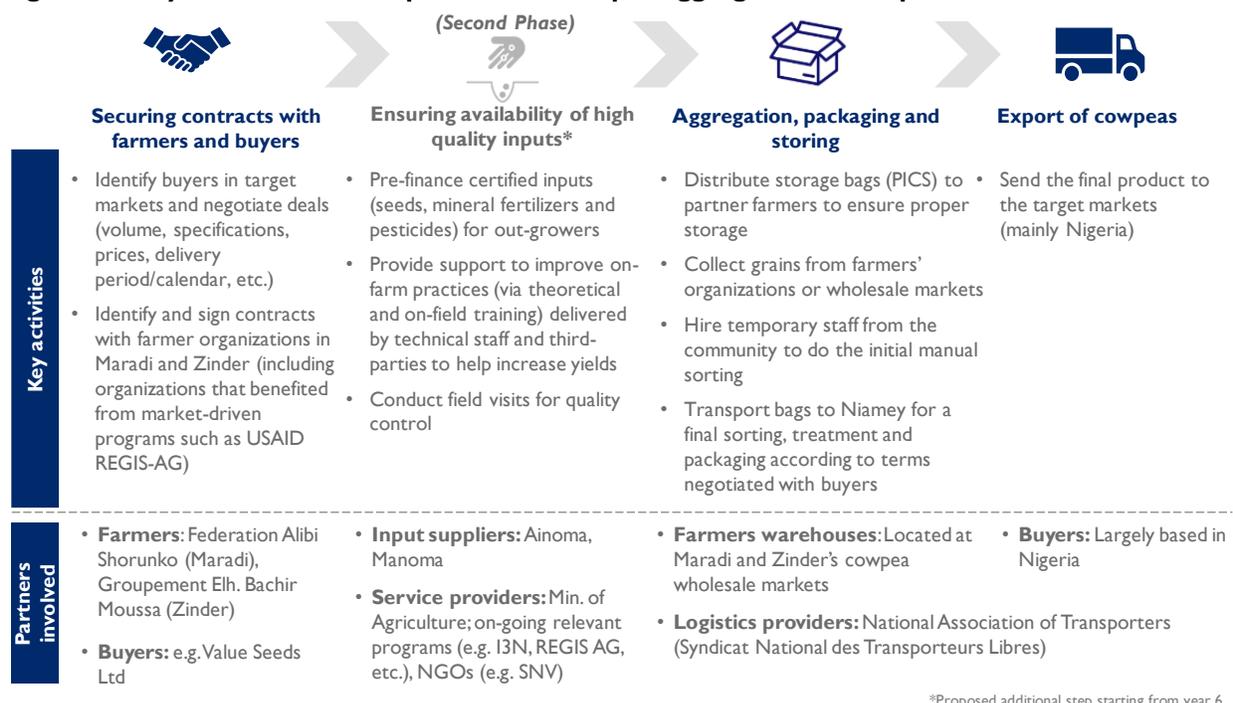
The success of this investment is strongly dependent on the anchor's ability to formalize relationships and agreements with key partners such as:

- Farmer organizations in Maradi and Zinder (including organizations that benefited from market-driven programs such as USAID REGIS-AG) that produce cowpea at the desired quality level, e.g., Federation Alibi Shorunko (Maradi) and Groupement Elh. Bachir Moussa (Zinder)
- Logistics service providers that could support aggregation and distribution of production, e.g., Syndicat National des Transporteurs Libres

- Grain import and distribution units in target markets that the business could supply following already established terms and conditions

Figure 15 outlines the actions the anchor will need to take to secure these partnerships that can help improve margins or otherwise facilitate the aggregation and export of cowpeas.

Figure 15: Key actions to secure partners for cowpea aggregation and export



*Proposed additional step starting from year 6

Financial / grant support

There are different ways through which access to capital could be facilitated in order to support the growth of this specific business opportunity.

- **Supporting the agricultural finance ecosystem:** The agricultural finance ecosystem is insufficient to meet the needs of farmers. Niger has one agricultural bank, BAGRI, which has products that are insufficient to meet demand and too costly for most actors. Government and donors can support innovative agricultural financing schemes to unlock the potential of the sector such as FISAN, the investment fund for food security and nutrition.
- **Providing grant funding:** Access to grant funding could enable the highlighted cowpea investment opportunity to provide technical training on best practices in cowpea production to its network of partner farmers before the start of each season.

Value Chain strengthening

There are additional opportunities for government and donors to help strengthen Niger's competitiveness in cowpeas – primarily in supporting production through activities that contribute to increasing yields, as well as facilitating export to regional markets.

- **Capacity building of farmers' organizations:** Government and donors can support the vertical integration of farmers with buyers or processors. While there are farmers' organizations organized to link smallholders to support production, most production remains small-scale and often inter-cropped, with farmers producing 0.5-1 ton per harvest. Further support to linkage platforms that connect farmers' organizations with private buyers can spur improved yields as can continued training to farmers, so they are better able to capitalize on demand from private buyers.
- **Supporting agricultural research and development:** Supporting agricultural research and development could help to improve yields through the development of seeds that are adapted to Niger's climate. Despite the scale of production, current yields in Niger are below regional averages due to low quality of inputs and weather variability given rain-fed agriculture systems. Government and donors can support research on seed varieties that are drought- and pest-resistant and support local production of pesticides that are cost-effective.

Policy

Additional policy support to limit the cost of logistics could be provided to strengthen the competitiveness of cowpea trade.

- **Addressing corruption at key trade borders:** Government and donors can also help address the costly challenge of corruption at key trade borders. Despite existing policies, corruption is cited as the main challenge for cross border trade, which can discourage players from engaging in export and reduce the margins of those that do engage. Government and donors can support the development of a reporting platform that identifies trade routes that are most affected by corruption and bribery and advocates for solutions to improve conditions, such as support introduction of upfront transit tax payment schemes.

5.3 ONION

5.3.1 MARKET OPPORTUNITY

Niger is well established in the export of onions in the ECOWAS region, with relative competitiveness in yield and production cost. Onion consumption in the ECOWAS region is strong and represents between 10% to 25% of total legume consumption.⁸¹ Imports in the region have experienced a year on year growth of 24% from 2014 to 2017, with Senegal and Côte d'Ivoire leading imports with about 200,000 tons each.⁸² Niger has the highest yield in Africa and 8th in the world at 28.9 tons per hectare and is the second biggest exporter in the region, with exports growing by 14% from 2014 to 2017.⁸³

While the Violet de Galmi is of high demand and dominates Niger's exports of raw onion to the region, the strongest business opportunity is in the Blanc de Gotheye variety, which is a highly attractive, cost-effective variety for onion powder processing with post-harvest loss rates of less than 1%.

⁸¹ Vieri Tarchiani et al, The onion sector: comparative study between Niger and Benin, 2011

⁸² ITC, ITC trademap databank, 2017

⁸³ FAO, FAOstat, 2017; ITC, ITC Trademap databank, 2017

Niger’s onion production and processing potential can tap into a wide range of international and regional actors operating in West Africa with a track record of sourcing locally, including food and beverage industry and supermarkets and retail outlets.

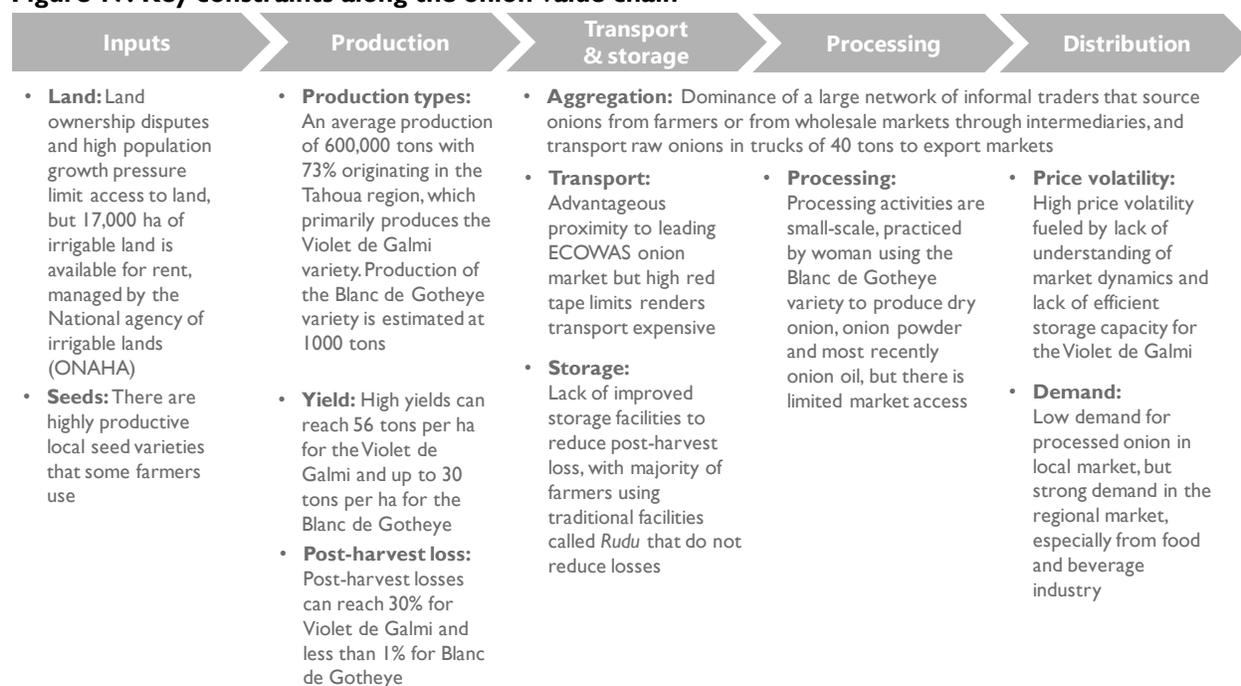
Figure 16: Selection of potential food and beverage and retail outlets that may source onion powder

	International actors	Regional actors
Food and Beverage (FnB) industry	 <p>Swiss FnB company with a strong presence in West Africa and a particular interest in sourcing ingredients locally</p>	 <p>FnB companies that are strong competitors to the Nestle Brand in the Senegalese and Ivorian markets, with a large range of food flavor enhancer products</p>
	 <p>Spanish-owned multinational with presence in Nigeria and Ghana and a subsidiary in Senegal</p>	 <p>Ivoirian-owned FnB company that has recently entered the space of food flavor enhancer production</p>
Supermarket / retail stores	 <p>French-owned supermarkets that have established themselves in Senegal and Côte d'Ivoire, with a growing interest in selling local products</p>	 <p>Locally owned supermarkets (Sakanal in Senegal and Price Ebeano in Nigeria) with a smaller market share when compared to large supermarkets such as Auchan, Carrefour and Spar but the go-to for local products</p>
		
	 <p>Dutch multinational group present in Anglophone Africa, including Nigeria</p>	 <p>Wholesale traders with low level of professionalism and mainly informal</p>

5.3.2 VALUE CHAIN OVERVIEW

Production capacity for onions in Niger is strong, buffered by past support to the professionalization of farmers’ organizations. However, competitiveness can improve through more efficient aggregation, storage, and better market access.

Figure 17: Key constraints along the onion value chain



Source: PRODEX, Plan d'actions filiere onion Niger, 2009; SNV, Importance de l'oignon au Niger; Stakeholder interviews; Dalberg analysis 2019

5.3.3 SPOTLIGHT ON POTENTIAL INVESTMENT

There is an opportunity to invest in the production of onion powder in Niger, which can offer an IRR of 24% over 10 years. The opportunity would require the investor to secure supply of Blanc de Gotheye variety onions and also identify buyers in target markets, including those in the food and beverage industry, to align production with their quality standards. The opportunity consists of four activities: 1) Securing contracts with farmers producing Blanc de Gotheye and farmers producing Violet de Galmi who are willing to change the onion variety produced, 2) Organizing the aggregation of production from target regions (Tillaberi is where most Blanc de Gotheye is produced), 3) Drying and processing onion into powder, and 4) Transporting to target markets.

The business case assumes that 1500 tons of Blanc de Gotheye would be aggregated from farmers in the Tillaberi region in the first year, with a 3% increase in aggregation capacity each year by offering competitive prices to farmers to encourage production. Thirty percent of production will be sold in Senegal through a partnership with a food and beverage company that is a leading importer of processed onion powder, and the rest to Nigeria (40%) and Côte d'Ivoire (30%).

Onion powder processing can be competitive in Niger due to the particular varieties grown in the country and the existing demand on the regional market. The Blanc de Gotheye is cost-effective to produce onion powder because of its low tenure in water and low post-harvest loss rate. There is also sustained interest from leading food and beverage companies based in West Africa to source onion powder produced locally.

Financial snapshot

Investment required	Approx. USD 1.4 million <i>Including land acquisition for the factory, construction of the factory, machineries, sanitary certifications as well as working capital on an average of USD 1 million</i>
Average sales (volume)	650 tons of onion powder per year on average
Average sales (value)	USD 1.7 million per year on average
IRR	24% over 10 years

Proposed location of the business



Potential anchor for the investment

The building blocks are in place to efficiently produce onion powder using Niger’s particularly suited Blanc de Gotheye variety. However, to unlock this production potential, an anchor for the investment would need to shift the market, which is strongly dominated by the Violet de Galmi variety due to its high demand in the regional market. Thus, an ideal anchor would:

- Be a current actor in the agricultural sector
- Exhibit the ability to influence agricultural production practices through past partnerships with a growing network of farmers
- Demonstrate experience producing onion powder in line with the quality and technical requirements of leading food and beverage industry players
- Develop commercial ties with established food and beverage companies, large supermarkets and small local food outlets in target markets
- Demonstrate a strong understanding of the risks and opportunities involved in agricultural commodity value chains
- Exhibit the ability to establish strong partnerships with government and donors to enhance agricultural production within a dispersed network of smallholder farmers

Business model financials & investment structure

The investment will require an initial capital investment of approximately USD 1.4 million, based on an aggregation capacity of the Blanc de Gotheye variety estimated at 1500 tons in year 1. This investment will include the costs incurred in setting up the onion powder producing factory, the machineries as well as required sanitary certifications to supply leading food and beverage industry players, estimated at USD 480,000. The investment will also help launch operations with costs estimated at USD 886,000 in year 1 and USD 1.3 million in year 10. This includes salaries and other administrative payments as well as costs incurred in the production and distribution of onion powder, including a premium price paid to farmers in the first few years of operation to encourage production of the Blanc de Gotheye variety at the required scale.

The average operating cost for the ten-year period is estimated at USD 1.1 million, along with a projected average gross margin of USD 536,000 that would require an average additional working capital of USD 138,000 each year to expand activities.

The most straightforward investment structure for this business is if it is the food and beverage company or store retailer that has full or partial ownership of the processing facility, which establishes the direct linkage to the market. In this case, there would be relevant adjacent support in the form of technical assistance to onion farmers that would help reduce key risks for the business.

Without the off-taker involved in financing, the investment structure could either take the form of concessional debt (to attract an anchor towards the business model) or as commercial financing (where some portion of finance is through a bank). In this case, technical assistance in the form of farmer training would still be of interest to reduce risks for the business, though it would not mitigate the risk of failing to secure a buyer relationship.

Potential risks

Key potential risks were identified that could limit the potential of the onion powder investment opportunity if not well-mitigated.

- **Failing to shift production towards the Blanc de Gotheye variety:** Despite the competitiveness of onion, key factors may hinder onion business operations if not managed well. The biggest concern for an onion processing business focused on the Blanc de Gotheye variety is the competing production with Violet de Galmi variety due to its higher popularity in the market. There would need to be concerted effort and promotion of the variety to encourage more farmers to shift to its production to ensure adequate supply for processing.
- **High processing costs relative to regional competitor:** The other major constraint, which may affect either the initial investment decision or the sustained competitiveness of onion powder processing in Niger is the cheaper processing costs in other markets, such as Senegal. Additional market studies to determine the potential returns on a similar set-up in other markets would help to determine where Niger could be more competitive in processing. Some of the initial feedback following conversations with a large food and beverage company that had previously scoped opportunities in Niger noted that the current level of production is insufficient to supply the desired scale of operations. Grant funding or low-interest finance of land and machinery acquisition could also help increase returns and further attract and secure deals with interested investors or companies.
- **Lack of technical expertise in industrial onion processing:** Another risk related to the onion processing business is the limited technical knowhow for industrial production of onion powder given lack of processing activities at scale. This risk is relatively low, as the business will aim to hire individuals with experience and technical skills to help establish operations from outside the Nigerien market as necessary.

Support required

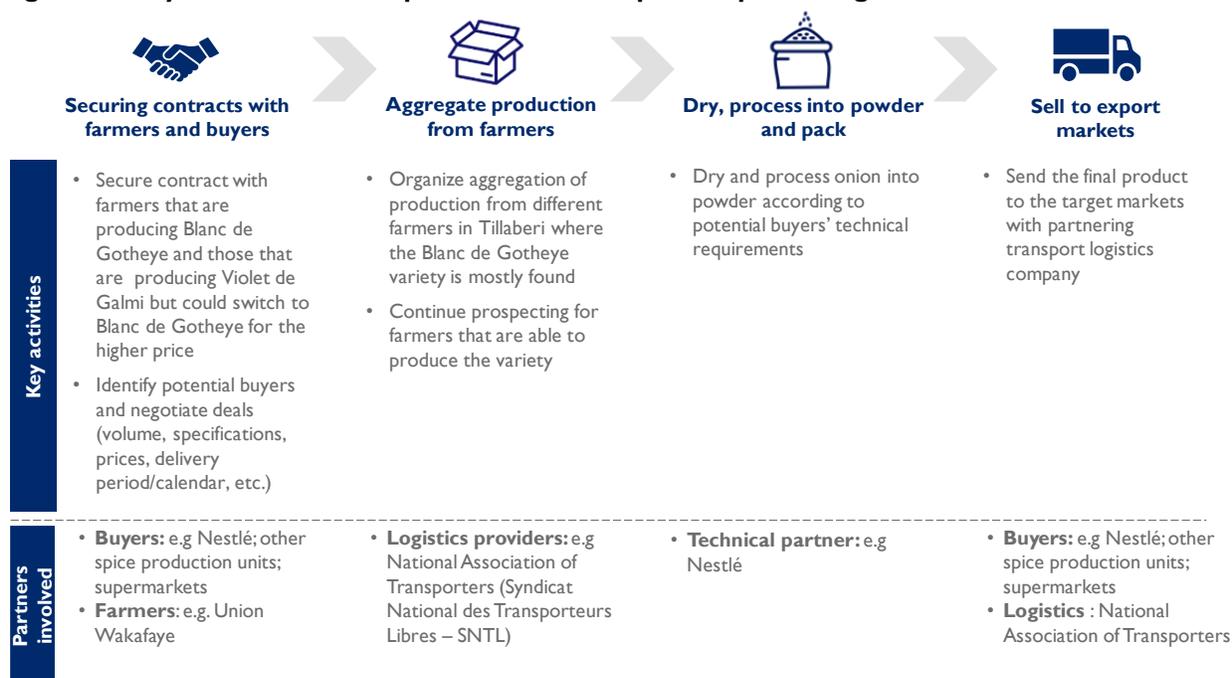
The success of this investment is strongly dependent on the anchor's ability to formalize relationships and agreements with key partners such as:

- Farmer organizations that are already promoting the production of the Blanc de Gotheye variety among farmers e.g. Union Wakafaye
- Logistics service providers that could support aggregation of the Blanc de Gotheye variety from farmers' organizations and distribution of onion powder production, e.g., Syndicat National des Transporteurs Libres

- Food and beverage companies in target markets that use onion powder as a key ingredient in their spice production, e.g. Nestlé, as well as supermarkets and small local food outlets

Figure 18 outlines the actions the anchor will need to take to secure these partnerships that can help improve margins or otherwise facilitate onion powder processing activities.

Figure 18: Key actions to secure partners for onion powder processing



Financial / grant support

Industrial onion powder processing could represent a robust investment if the anchor accesses financing instruments that provide additional incentive to enter the market.

- **Concessional loans:** Access to initial capital could be disbursed through a debt instrument paired with some percentage of grant funding. This is to incentivize project uptake and growth given the current low production level of the key input, Blanc de Gotheye; and the almost inexistent local knowhow of industrial onion powder production. The subsidy could be in the form of input finance directly provided to smallholder farmers to encourage production of the Blanc de Gotheye variety.

Value Chain Strengthening

There are also interventions for the broader onion value chain that could contribute to increased production.

- **Promoting the Blanc de Gotheye:** Government and donors can support the upstream production of the Blanc de Gotheye by engaging with farmers' organizations and existing programs (e.g., I3N) to help promote additional production of the variety and provide technical support for the training of farmers in good agricultural practice specific to the variety.

5.4 SOLAR

5.4.1 MARKET OPPORTUNITY

Access to electricity in Niger remains among the lowest in Africa. Only around 10% of the population has access to electricity from the grid, far below the Sub-Saharan Africa average of 31%. Grid access to electricity is largely concentrated in urban areas: around 70% of the population living in Niamey has access to electricity, compared to only 1% in rural areas.⁸⁴

Even for grid-connected consumers, power access is highly sporadic. Blackouts are extremely frequent due to low generation capacity and underdeveloped infrastructure and continue to drive heavy reliance on energy imports from Nigeria and back-up power solutions, mostly diesel generators. Around 12% of the population has access to electricity, far below the Sub-Saharan Africa average of 31%. In 2017, household access to electricity was 16% with an average consumer spending USD 14 per month.⁸⁵

According to a 2016 report commissioned by the Lighting Africa Program, about 42% of households are situated over 10 km from the grid and are unlikely to be grid-connected in the near term. Expanding the grid to these areas would be costly. For example, expanding the grid by 20 km would require USD 6,000 per household while expanding the grid to a distance as small as 5 km range would cost USD 1,100.⁸⁶

Efforts to extend the grid are impeded by low population density and purchasing power: 27% of the Nigerien population live in areas with less than 500 people, and 42% in areas with a population of 501-2,000.⁸⁷

As an alternative, off-grid solutions can also be competitive in areas where the grid can expand in the near term (below 10 km range) and even in areas already covered by the grid (e.g., as backup-up solutions given unreliable power supply). It is estimated that Niger's off-grid solar market could reach up to USD 200 million per year with necessary investments.⁸⁸

5.4.2 SECTOR OVERVIEW

Niger provides an opportunity for expansion into a market of 20 million people, which could be of particular interest to players that are operating in smaller markets in West Africa. However, growth of solar energy faces key challenges both on the supply side and demand side.

Supply side

On the supply side, solar companies face challenges reaching customers at scale, and particularly those dispersed in the rural areas. Only a small number of players operate scalable, market-driven business models focusing on sales to end-consumers (whether they be households, productive users, or communities). At present, there is only one entity in Niger engaged in direct distribution of solar devices to private household end-consumers, offering a range of solar lanterns, but sales to-date have been

⁸⁴ World Bank, World Bank help to Increase Access to Electricity in Niger, 2015; Open Capital Advisors, Niger Off-grid solar market assessment, 2017

⁸⁵ World Bank, World development indicators, 2017

⁸⁶ Open Capital Advisors, Niger Off-grid solar market assessment, 2017

⁸⁷ Institut National de la Statistique, Annuaire Statistique 2013-2017, 2018

⁸⁸ Open Capital Advisors, Niger Off-grid solar market assessment, 2017

modest. As a result, the distribution of small solar devices is dominated by informal actors that often sell products of low quality and of limited durability.

Mobile money, which has been instrumental in scaling solar technology in other Sub Saharan African markets particularly through PAYG systems, has had low uptake in Niger. In Niger, only around 7% of Nigeriens subscribe to mobile money services, and based on consultations with MNOs, only about 1.5% of Nigeriens are active users.

Demand side

On the demand side, consumers have limited purchasing power and few options to finance the purchase of solar devices on credit. Uptake of solar lanterns and SHS for household use in Niger is constrained by limited purchasing power. Significant market intervention will be required to stimulate demand by building awareness of key benefits and increasing the risk appetite of lenders to engage in consumer finance. The World Bank has set up NESAP with a component on consumer financing, but demand for credit for solar products remains low as there is limited awareness of the program.

The other challenges on the demand side relate to the geography of consumers and the perception of solar products. There is low population density, which makes it difficult to reach customers in remote areas and reach scale. Consumers have negative perceptions of solar products because of the prevalence of low-quality products on the market.

Figure 17 provides an overview of key solar products, with an overview of the market size, demand, and key barriers to entry for Niger. Whereas the simple study light and standing light overall have lower potential for an interested business due to the prevalence of cheaper quality products, there is market opportunity for solar lights with mobile charges and larger devices. For these products, there is high enough market demand, but further investment in product promotion and consumer financing could unlock uptake.

Figure 19: Overview of solar products market and barriers to entry in Niger

Products	Potential demand & market size	Barriers to entry	Overall score
Simple study light 	<ul style="list-style-type: none"> Market is limited as the consumers that can afford the product would prefer products with more features Consumer financing could create a market of 639,000 units per year 	<ul style="list-style-type: none"> Market dominated by informal distributors Products do not offer sufficient features to compete with the cheaper, lower quality products More consumer financing options are needed to reach the base of the pyramid 	
Standing light 	<ul style="list-style-type: none"> Annual demand estimated at 604,000 units. But with consumer financing, consumers would transition to more versatile systems 	<ul style="list-style-type: none"> Market dominated by informal distributors Product does not offer sufficient features to compete with the cheaper informal market products 	
Light & mobile charger 	<ul style="list-style-type: none"> Annual demand estimated at 152,000 units without consumer financing and 289,000 units with consumer financing 	<ul style="list-style-type: none"> Market dominated by informal distributors, and high-quality suppliers would need investment in marketing to differentiate their products from competition Does not need consumer financing, but would benefit from it 	
Products above 24.5 Wh 	<ul style="list-style-type: none"> Without consumer financing, annual demand for SMLS is ~2,000 units and not for the SHS However, with consumer financing annual demand would represent ~43% of market sales volume (including 102,000 for SMLS; 116,000 for basic SHS; 9,000 for medium SHS; and 1,200 large SHS) and 94% of market value of solar lanterns and SHS 	<ul style="list-style-type: none"> Requires consumer financing Businesses require high working capital given supply payment terms (30% upon placement of the production order and 70% upon shipment), delivery times of up to 3 months and long inventory holding times. This gap may be addressed by upcoming programming: the World Bank has set up NESAP with a component on corporate financing 	

5.4.3 SPOTLIGHT ON POTENTIAL INVESTMENT

The investment will provide high-quality solar products with a payment scheme tailored to the budgets of target customers, including households in areas not covered by the grid or not served by a reliable grid. The business will be rolled out in two steps:

- Step 1 (years 1-2):** Geographical focus on areas with mobile network coverage, as the customer relationship management and after-sales services will be managed through a PAYG platform
- Step 2 (from year 3):** A franchise model established across rural areas with targeted local hardware stores (or other similar outlets) to serve as sales points and points of contact for the company's offline customer management and after-sales support

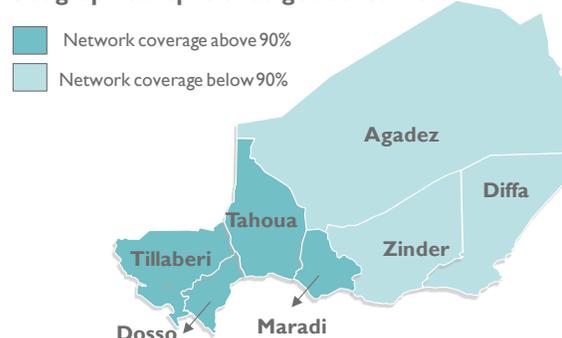
The business opportunity is predicated on the entry of a well-established player in West Africa that is already operating a PAYG model. While most products would be sold through PAYG, the business would also reserve some products to be sold through cash sales to support cash flow. A single business could provide electricity to over 15,000 households over 10 years provided that solar products remain exempt from duties and VAT.

Beyond supporting electricity access, the investment would have broader social impact. In other countries, off-grid solar power has enabled and improved economic activities; findings from a report from Gogla, the Global association for the off-grid solar energy industry, show that nearly 60% of off-grid solar owners undertake more work within just three months of using a solar home system.⁸⁹ Solar power contributes to improving health (by replacing kerosene lamps) and education, creating jobs and income opportunities in addition to cost-savings.

Financial snapshot for a solar company:

Investment required	Approx. USD 1.9 million (mostly working capital for inventory)
Average sales (volume)	• Products sold to 10,000-15,000 households
Average Sales (value)	• USD 3.1 million per year on average
IRR	• 12% over 10 years

Geographical split of target consumers



Potential anchor for the investment

An ideal anchor would:

- Be a well-established player in the solar product market, either in Niger or another West African market
- Demonstrate ability to import and distribute quality solar products in West African markets
- Display potential to reach scale through past experience establishing consumer financing models such as PAYG models in other similar markets (Benin, Senegal, etc.)
- Demonstrate the ability to increase consumer confidence through effective aftersales services and other customer support schemes
- Be able to develop commercial ties with existing telecommunications companies or other independent PAYG service providers
- Demonstrate a strong understanding of the risks and opportunities that are specific to the Nigerien solar market
- Exhibit the ability to establish strong partnerships with government, donors and established financial institutions, which are active in the solar market, to increase access to solar products from rural populations

Business model financials & investment structure

The investment will require initial capital of approximately USD 1.9 million which will include the costs incurred in setting up the PAYG system and distribution network as well as equipment (mainly laptops) costs, all estimated at USD 1 million. The investment will also help launch operations, mainly building inventory, with costs estimated at USD 990,000 at the end of year 1 and USD 4.1 million by year 10. This includes salaries and other administrative payments as well as costs incurred in the import and distribution of solar products including products, custom duties, shipment and local distribution.

⁸⁹ Gogla and Atlai Consulting, Powering opportunity – the economic impact of off-grid solar market, 2018

The average total operating costs for the ten-year period is estimated at USD 2.1 million, along with a projected average gross margin of USD 679,000 that would require an average additional working capital of USD 128,000 each year to expand activities.

The investment structure is most likely to benefit from a blended finance fund that is able to provide some combination of grant funding and loans, with additional adjacent support in the form of risk mitigation (on the consumer finance end) and preparation costs (for purchase of inventory and setting up the PAYG system). Since the likely anchor is an existing business operating in the region, the business may have several commercial financing options, including those outside of Niger, and where the company has an established relationship with the bank.

Potential risks

The greatest risks related to the business opportunity are competition from low quality products sold by informal actors (which can affect uptake) and payment defaults for the PAYG model.

- **Competition from low quality products:** There is no regulation to limit distribution of counterfeit products. Informal actors sell low quality products at a cheap price that have also negatively affected trust in solar products. To mitigate this risk, the business can collaborate with other solar product distributors on marketing campaigns to help customers better differentiate the quality of products and increase willingness to pay for quality.
- **Payment defaults:** The other major risk to the business is the inevitable payment default risk for all customer segments. Because the PAYG model offers products on credit, the business is put at risk if the default rate rises above a certain threshold. In other markets, the default rate is maintained at 20-30%, and businesses mitigate risk by maintaining ownership of the devices as a collateral.⁹⁰
- **Low mobile and mobile money penetration risks:** Other risks to the business include the low mobile and mobile money penetration rates. Mobile penetration is 41% and mobile money usage is 7% in Niger.⁹¹ This will likely limit the extent to which the PAYG model and online after sales services can grow quickly, so the business will need to invest in a network of agents that will support growth beyond mobile coverage and ensure the availability of in-person support services.
- **Logistics complexity due to low population density:** The business will also need to manage the complexities and logistics of serving a dispersed customer base. Niger has one of the lowest population densities of the region and the traditional delivery model will not be profitable for more remote areas. To mitigate this risk, the business can organize distribution networks by partnering with organizations and individuals that are already present in the target areas (MFIs, MNO retail shops, local entrepreneurs, farmers' organization, etc.).

Support required

The success of this investment is strongly dependent on the anchor's ability to formalize relationships and agreements with key partners such as:

- Solar product manufacturers, which are able to supply products according to pre-defined terms and conditions, e.g., Lorentz, Schneider

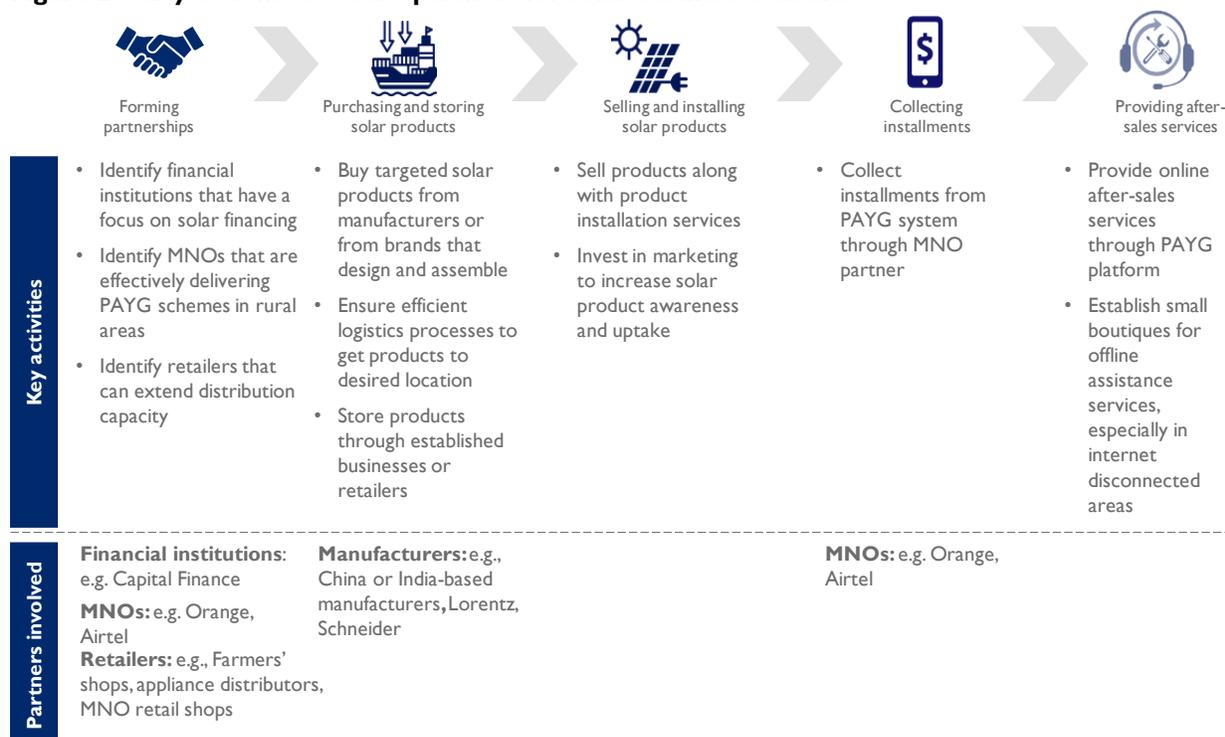
⁹⁰ Dalberg, Off-Grid Solar Market Trends Report, 2018

⁹¹ GSMA, The economic impact of telecommunication in Niger, Digital inclusion and mobile taxation in Niger, 2017

- Mobile Network Operators, which will be able to provide support in establishing the PAYG model e.g. Orange
- Local retailers, which would be able to assist the distribution of products in selected areas, e.g. farmer shops and appliance distributors
- Financial institutions, which are beneficiaries of the World Bank NESAP project, e.g. Capital Finance

Figure 20 outlines the actions the anchor will need to take to secure these partnerships that can help improve margins or otherwise facilitate the solar business' activities.

Figure 20: Key actions to secure partners for solar business activities



Financial / grant support

The research highlighted different financing pathways that could support the growth of this investment opportunity and concurrently unlock the potential of the broader solar market in Niger.

- **Inventory finance:** Support to the business model could come in the form of a commercial debt instrument that would provide access to capital for inventory. The structure of the debt instrument would need to be tailored to the anchor investment's PAYG model to mitigate the cash flow issues that might be linked to the longer customer repayment periods. As such, the financing partner could also concurrently provide consumer financing models to the anchor investment's target markets to increase product uptake and align on repayment terms from both parties.⁹²
- **Grant funding:** An additional investment could be provided in the form of grants to support project management and implementation as well as capacity building to effectively draft and roll

⁹² The world bank NESAP project currently provides commercial financing to both solar energy companies and their clients, mostly households and farmers

out additional processes and procedures that would be needed to effectively respond to the precarity of the Nigerien solar market. These could be in the form of product usage and care services given to customers.⁹³

- **Consumer finance:** There is also an opportunity for government and donors to support solar businesses reaching customers at scale through consumer finance, better incentives to reach base of the pyramid customers, and an adapted regulatory framework to structure the solar industry.
- **Guarantees to banks and MFIs targeting key segments:** Government and donors can provide guarantees and support to local banks and MFIs to develop attractive customer financing products targeted to different segments (e.g., agricultural household vs urban middle class). Few financial service providers have products for financing solar equipment acquisition, and, when available, the credit terms are prohibitive.
- **Incentives to extend market focus:** There is also an opportunity to foster better partnerships between financial institutions and solar product companies by setting up financing mechanisms to induce the creation of products for the solar industry. This may help attract more solar companies to extend their market focus. Many players in Niger focus their activities in Niamey and occasionally in rural areas to deliver donor-funded programs because of the limited purchasing power in rural areas. Since the PAYG model in Niger is just emerging as a solution and the actors have limited experience developing PAYG systems in similar contexts, government and donors can facilitate collaboration and learning among actors from existing models in similar markets.

Policy

Improvements to the regulatory framework are also needed to foster growth of the solar market.

- **Technical support:** While efforts are being made to foster a more conducive legal environment for the solar industry in Niger, the execution and enforcement, especially for customs duty relief, is not sufficient. Government and donors can work on the development of the regulatory framework for solar energy and draw on learnings from more mature markets such as Mali.

93

6. CONCLUSION

In addition to specific investment support, a number of cross-cutting activities have emerged for USAID. These activities can contribute to better positioning the investment opportunities for investors so that they are more willing to overcome the structural challenges of the Nigerien market (landlocked geography, insecurity, poor infrastructure). To target investment in these areas, further work is needed in several areas:

- **Visibility on the cost of cross-border trade:** Invest in a regional reporting platform to identify trade routes and border crossings that are most affected by corruption and bribery. This can help improve the enabling environment and reduce trade barriers related to Niger's geography by lowering costs, reducing delays, and minimizing product losses.
- **Affordability of essential products:** Invest in financing mechanisms that would improve the affordability of key products for farmers and rural households. Key limitations in the agriculture sector and solar market are the willingness to pay for improved inputs and quality products.
- **Professionalization of farmers:** Support professionalization of farmers' organizations to develop supplier relationships with processors & exporters, and more consistently supply products to buyers.

ANNEX A: ADDITIONAL ANALYSIS ON IMPORTS & EXPORTS

- Export promotion and import substitution have been analyzed using a tool, developed based on the methodology/data used by the [Atlas of Economic Complexity \(AEC\) at Harvard's Center for International Development](#). The tool goes beyond the typical focus on growth to find opportunities for increasing the *complexity and diversity of a country's economic system*
- This focus on complexity and diversity is critical if countries are to upgrade into more value-added activities (e.g., advanced manufacturing) rather than simply grow within low value-adding ones (e.g., production of unprocessed foods).
- The tool can be used to identify new opportunities for transformational growth both within and across individual countries at product-level (1245 distinct categories).

Criteria for import replacement

- **Country import value, 2016 (USD)**
- **Median annual product import growth, 2012-2016 (%)**
- **Feasibility of entering/expanding production (0-1):** looks to capture the extent of a location's existing capabilities to make the product as measured by how closely related a product is to its current exports

Criteria for export promotion

- **Country export value, 2016 (USD)**
- **Median annual product export growth, 2012-2016 (%)**
- **Distance rating (high, medium, low):** Feasibility of entering/expanding production which looks to capture the extent of a location's existing capabilities to make the product as measured by how closely related a product is to its current exports
- **Median global annual product import growth, 2012-2016 (%)**

Potential import substitution: the model identified an initial list of commodities

Products	Country import value (USD) 2016	Median annual product import growth, 2012-2016 (%)	Feasibility of entering/expanding production (2016)
1. Wheat or meslin flour	10,214,912	21%	0.46
2. Rice	58,974,516	18%	0.34
3. Other furnishing articles	3,015,390	191%	0.28
4. Sugarcane & sucrose	8,866,987	17%	0.25
5. Palm oil	77,141,552	17%	0.17
6. Gypsum	1,025,105	56%	0.17
7. Fruit juices	1,701,730	26%	0.10
8. Containers for multimodal transportation	3,019,219	135%	0.07
8. Legumes	368,957	847%	0.05
9. Cements	63,279,280	16%	0.02
10. Soups and broths	13,530,415	18%	0.01
11. Wheat and meslin	14,262,893	162%	0.01
12. Other vegetables	346,298	191%	0.00

Potential export promotion: the model identified an initial long list of 20 commodities

Products	Country export value, 2016 (USD)	Median annual country export growth (2012-2016)	Distance 2016 rating (High)	Median annual world import growth (2012-2016)
1. Legumes, dried	2,892,613	864%	High	6%
2. Avocados, pineapples, mangos, etc.	371,212	216%	High	13%
3. Other oil seeds	117,041,008	168%	High	5%
4. Spices	250,735	52%	High	7%
5. Pasta	1,784,667	436%	High	2%
6. Gold	15,771,303	-17%	High	15%
7. Bags for packing goods	79,136	964%	High	0%
8. Flour of dried legumes	153,847		High	13%
9. Other nuts	82,474		High	10%
10. Crustaceans	1,373	1319%	High	8%
11. Fruits and nuts, otherwise prepared	59,520	51%	High	3%
12. Milk, concentrated	360,172	783%	High	2%
13. Onions, shallots, garlic	6,468,013	-32%	High	10%
14. Vegetables, dried	91,346		High	5%
15. Lead refined unwrought	117,784		High	2%
16. Tubers	1,441,806	-31%	High	5%
17. Other live plants	235,388	380%	High	1%
18. Waters, flavored or sweetened	30,055	67%	High	5%
19. Pepper	5,911		High	11%
20. Seaweeds & edible vegetable products	77,322	-13%	High	3%

ANNEX B: STAKEHOLDER LIST

Donor agencies, DFIs & NGOs

- FAO
- Power Africa
- REGIS-AG
- SNV
- World Bank

Government agencies

- ANPER
- ANPIPS
- Direction des statistiques agricoles
- Direction générale de l'agriculture
- Ministère de l'agriculture et de l'élevage
- PASEC (PRODEX)
- RECA
- Système d'Information des Marchés à Bétail
- Système d'Information des Marchés Agricoles

Private sector / Industry associations

- Abattoir frigorifique de Niamey
- Ainoma
- Association des Bouchers de Niamey
- Association des Eleveurs du Niger
- Association des Producteurs de Niébé du Niger
- Association Nationale des Professionnels de l'oignon
- Bonergie SARL
- Capital Finance
- Fédération Internationale des Groupements Interprofessionnels de la Filière Bétail Viande
- Nestlé
- Nigelec
- Niger Energie Solaire
- Oolu Solar
- Orange Niger
- Qotto
- S.E.S Energy
- SINES
- Solarex Energy
- SONIPEV
- Sud Solar System
- Syndicat National des Transports Libres
- Value Seeds Ltd
- Yandalux

Meetings in Zinder

- Chambre Régionale de l'Agriculture
- Direction Régionale de l'Agriculture
- Direction Régionale de l'Elevage
- Fédération des Coopératives Maraîchères du Niger (FCMN Niya) / Fédération des Unions des Boutiques d'Intrants (FUBI)
- Fédération Régionale des coopératives de Zinder
- Association des Agriculteurs "Manoma" Damagaram Takaya
- Centre de Service en Appui aux organization Coopératives et Paysanes
- Interprofession Niébé
- Coopérative Gayar Noma
- Accsa Afrique Verte
- Coopérative Hadawa
- Union Maata Masu Kuzari / Ciciga Waké
- Union Gamji
- CAPAN Zinder
- NAS Zopian
- Niger Electro Service
- + Meetings with 2 transporters and 1 trader/middleman

Meetings in Maradi

- Chambre Régionale de agriculture (CRA)
- Direction Régionale de l'Agriculture (DRA)
- Direction Régionale de l'élevage
- Centrale d'Approvisionnement des Intrants et Matériels Agricoles (CAIMA)
- Fédération FUMA Gaskiya
- Interprofession Bétail Viande Cuire Peau (IP/BVCP)
- Coopérative Hadin Kan Jama'a
- Union Amana Tchadoua
- Union Madibi Rabiou Magagi
- Association pour la Redynamisation de l'Elevage au Niger (AREN)
- + Meetings with 3 producers, 5 traders

ANNEX C: SOURCES CITED

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ANNEX D: INVESTMENT CASE FINANCIAL MODELS

ANNEX E: LONG LIST OF INVESTMENT OPPORTUNITIES

ANNEX F: PRESENTATION – INFORMATION MARKET GAP RESEARCH

ANNEX F: PRESENTATION – VALUE CHAIN INVESTMENT OPPORTUNITIES ANALYSIS