International Finance Corporation

Market Assessment – Irrigation Finance in Niger

Final report

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ACRONYMS

AECID	Agence espagnole de coopération internationale pour le développement
AFD	Agence Française de Développement
ANFO	Association Nationale des Coopératives des Professionnels de la Filière Oignon
ARSM	Agence de Régulation du Secteur de la Microfinance
BAGRI	Banque Agricole du Niger
BAN	Banque Atlantique du Niger
BCEAO	Banque Centrale des Etats d'Afrique de l'Ouest
BIA	Banque Internationale pour l'Afrique au Niger
BIDC	Banque d'Investissement et de Développement de la CEDEAO
BOA	Bank of Africa
BSIC	Banque Sahélo-saharienne pour l'Investissement et le Commerce
CAIMA	Center For Agricultural Inputs and Materials
CC	Climate Change
CCPHN	Confédération Coopérative Paysanne Horticole du Niger
CICR	Comité International de la Croix Rouge
CIF	Climate Investment Funds
CPEC	Caisse Populaire d'Epargne et de Crédit
CRAs	Regional Chambers of Agriculture
DAC/POR	Direction de l'action coopérative et de la promotion des organisations rurales
DFS	Digital Financial Services
EU	European Union
FCMN	Fédération des Coopératives Maraîchères Niyya
FI	Financial Institution
FISAN	Food Security and Nutrition Intervention Fund
FO	Farmers' Organization
FSA	Fonds de Solidarité Africain
FUGPN	Fédération des Unions de Groupements Paysans du Niger Mooriben
GDP	Gross Domestic Product
GHC	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IFC	International Finance Corporation
IPAE	Investisseurs et Partenaires Afrique Entrepreneurs
JRC	Joint Research Report / Centre Commun de Recherche
MFI	Microfinance Institution

NESAP	Niger Solar Electricity Access Program
NGO	Non Governmental Organization
NIP	Niger Irrigation Program
ONAHA	National Office for Hydro Agricultural Development
PADAD	Projet d'Appui au Développement Local
PAIF	Projet d'Appui à l'Inclusion Financière
PAPI	Projet d'Appui à la Petite Irrigation
PDB	Public Development Bank
PECEA	Projet de Promotion de l'Emploi et de la Croissance Economique dans l'Agriculture
PET	Potential Evapotranspiration
PFPN	Plateforme paysanne du Niger
PIC	Programme Indicatif de Coopération
PIMELAN	Projet Intégré de Modernisation de l'Elevage et de l'Agriculture au Niger
PMEA	Petites et Moyennes Entreprises Agricoles
PPCR	Pilot Program for Climate Resilience
PPIP	Pilot Project to Promote Private irrigation in Niger
PPR	Rural Poles Project
PRADEL	Programme d'Appui au Développement de l'Elevage
PROMEL	Programme de promotion de l'Entrepreneuriat local
RECA	Réseau des Chambres d'Agriculture
RPC	Representative Concentration Pathways
SFD	Systèmes Financiers Décentralisés
SNFI	National Strategy for Inclusive Finance
SPIN	Strategy for Small-scale Irrigation in Niger
TA	Technical Assistance
VC	Value Chain
VSME	Very Small, small and Medium Enterprises
WAEMU	West African Economic and Monetary Union
WB	World Bank
YTM	Yarda Tarka Maggia

1. Context and objectives of the assignment

1.1 Context of irrigation in Niger

(1) Agriculture in Niger is severely impacted by climate change, with dire consequences for food security and sovereignty.

Nested in the Sahel (the nearest coastline is 700 km away from the southern border), Niger's current climate is generally arid, with a large northern part located in the Saharan zone with average annual rainfall of 10 mm and a Sahelian to Sudanese-Sahelian fringe in the south with average rainfall of no more than 800 mm per year. The country has only one rainy season, which extends from May to October. Average annual temperatures range from 23°C to 30°C, with higher values in the south of the country.

According to official census data, 84% of the Nigerien population live in rural areas and depend on natural resources for their livelihood. The rural sector (agriculture, livestock, forestry, and fisheries) accounts for 44% of Gross Domestic Product (GDP) and employs 90% of the working population. Vegetable production is concentrated in the south of the country and represents only 12% of the total surface area[1].

In this context, Climate Change (CC) is a major concern for the economy and development of the country. Adverse effects are already perceptible with temperatures rising 1.5 times faster than the global average, daytime highs soaring above 45°C and increasingly frequent prolonged dry seasons and multi-year droughts.

Projected future CC impacts depend on the greenhouse gas (GHG) representative concentration pathways (RCP) considered. Available long-term projections[2] (up to 2080) indicate:

- An increase in the average air temperature of between 2.0°C and 4.6°C, which would translate into nearly 300 very hot days (maximum temperature above 35°C) per year;
- A probable increase in annual precipitation, albeit relatively small (under 29 mm), and an increase in the frequency of heavy precipitation events (around nine days per year on average);
- Increased potential evapotranspiration (PET), which could reach 2.45 times its current value by 2080 in the worst-case scenario.

The impacts of these changes are potentially considerable. Although a possible CO_2 fertilization effect could benefit certain crops (millet, sorghum, cowpea, and groundnut), the increased exposure to drought and flooding, and the reduction in water availability per capita (-85% in 2080 if the current demographic trends are maintained) would jeopardize existing agricultural and pastoral systems.

[1] FAO 2022 FAOstat [online] https://www.fao.org/faostat/en/#country/158

[2] Gornott, C., J. Tomalka, S. Lange, & F. Rörig 2021. *Profil de risque climatique : Niger*. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Bonn, Deutschland. 12 p.

Food security and sovereignty are already major concerns in Niger: In recent years, the prevalence of undernourishment has risen dramatically and reached levels unprecedented since 2004, most probably as a consequence of the COVID-19 crisis and subsequent disruption of food supply chains. Securing sustainable food crop production in the country is therefore an absolute development priority.

(2) Increased access to irrigation can make Niger's agricultural sector more resilient to climate change and enhance food security for the country.

Rainfed farming is the dominant production method in Niger. Without irrigation, yields are highly dependent on rainfall, and therefore vulnerable to Climate Change. Small-scale irrigation presents an obvious advantage in this context, and can dramatically improve farmers' yields, income, and resilience.

- Irrigation can allow yield increases up to 800%, depending on the crops in question and techniques used. The best results are achieved with drip irrigation, which is the most efficient irrigation method.
- Irrigation makes agriculture more predictable, with less interannual variation, and thus enhances a farmer's ability to project future incomes (and thus to invest in productive assets).
- Access to irrigation allows farmers to diversify their production and to switch (totally or partially) to more rewarding crops such as onions, tomatoes, and other vegetables.
- The ability to cultivate during the dry season allows farmers to cultivate their land for a longer period, and to choose the timing of their harvest (to take advantage of higher market prices, for example). The corresponding income is not only higher, but also better spread over the whole year. Production risks (pests, conservation issues) can also be reduced thanks to a better timing of production.

Despite the arid nature of the country, Niger has significant irrigation potential: groundwater flows are estimated at 2.5 billion cu. m per year, of which less than 20% is exploited. Non-renewable groundwater resources are estimated at more than 2,000 billion cu. m, virtually untapped for agriculture. These non-renewable resources are beginning to be exploited by mining and oil. Surface water resources, on the other hand, are estimated at about 30 billion cu. m per year, of which less than 1% is exploited.[3]

According to a Ministry of Agriculture and Livestock study, Niger has irrigable potential of over 10 million hectares, including around 5.7 million hectares where the water table lies at a depth of between 0 meters and 15 meters, i.e., suitable for small-scale irrigation.[4]

Small-scale irrigation programs started in the Niger droughts of 1983, with the objective of reaching as many producers as possible, outside the large-scale irrigation perimeters. While the first attempts were based on State-managed collective irrigation perimeters, management issues resulted in a strategic shift during the 1990s, with a strong focus on the private sector.

This strategy is still relevant today, and support to private, small-scale irrigation is one of the pillars of Niger's development strategies such as the I3N (which stands for the main food security and rural development strategy at country scale, the *Initiative "les Nigériens nourissent les Nigériens"*).

[3] Ministère de l'Hydraulique et de l'Assainissement 2017. Plan d'Action National de Gestion Intégrée des Ressources en Eau, PANGIRE Niger, Adopté par Décret n°2017/356/PRN/MHA du 09 mai 2017. Niamey, Niger, 158 p.

[4] Ministère de l'Agriculture – Direction Générale du Génie Rural 2015. *Évaluation du potentiel en terre irrigable du Niger*.

(3) Large-scale implementation of small-scale irrigation strategies requires increased involvement of the private sector, and especially greater mobilization of private commercial funds.

Small-scale irrigation requires equipment to be acquired at individual or small group level. Most Nigerien farmers do not have the financial capacity to buy this equipment. Hence, the implementation of national small-scale irrigation strategies means financing sources for these farmers have to be available. Thus far, these investments are largely funded by donor funds with very limited involvement of the private financial sector. Increased involvement of commercial finance is needed to ensure access to small-scale irrigation in broader scale and at country level.

1.2 The assignment

(1) HORUS, Salvaterra and BNIC were mandated by IFC to carry out a market assessment on irrigation finance in Niger. This report constitutes the second deliverable of the assignment.

(2) The objective of the assignment is to assess the potential to scale up the commercial irrigation market and access to finance for smallholder farmers in Niger.

The report focuses on the following aspects:

- Deepen understanding of existing gaps for development of a commercial financial offer for irrigation in Niger;
- Identify suitable irrigation solutions as well as potential partners within the agricultural value chains;
- Identify potential partners within the Nigerien financial sector
- Make recommendations on financial schemes to develop and/or scale up.

(3) The study has been organized in four phases:

- **Documentary review and finetuning of the research framework**
- **A field survey undertaken by local irrigation experts from BNIC in Maradi, Tahoua, Agadez, Tillabéri and Dosso**
- **Meetings with national-scale players in Niamey undertaken by the international experts from HORUS and Salvaterra**
- **Analysis and report**

The study started with a documentary review and finetuning of the research framework. This preliminary work has been presented under the form of an inception report. During this first step, the objectives and scope of the study were honed. The Consultant and IFC agreed on the following aspects:

- The focus of the study should be on small-scale irrigation.
- The Consultant should focus on promising agricultural value chains.

- One of the main objectives of the study is to identify a partner financial institution to scale up commercial irrigation finance.

Zones for the field survey, as well as objects of study per zone were identified as follows:

Zone	Production basin	Value chains to focus on (pre-selection)	Irrigation systems
Agadez	Irhazer	Citrus, gardening (tomato)	Semi-californian, manual, motor pump
	Aïr	Citrus, onion, potatoes, gardening (tomato)	Semi-californian, manual, motor pump
Maradi	Goulbis	Tomato, moringa	Water control, Californian, semi-californian, drip
Niamey / Tillabery	Niger River, Dallol Bosso	Potatoes, gardening (tomato)	Water control, Californian, semi-californian, drip, sprinkling
Tahoua	Maggia, Tarka, water reservoir	Onion (incl. from Galmi), tomato, gardening	Water control, Californian, semi-californian, drip
Dosso	Dallols Bosso & Dallol Maouri et le fleuve Niger	Citrus, gardening	Water control, Californian, semi-californian, drip

Data collection was organized in two distinct phases:

- The first step of the market assessment was undertaken in five selected areas, through visits in regional capitals of Niger (two days per region). This step was prepared by the consortium (interview guides and selected remote meetings to finetune survey preparation). The field assessment was then carried out by BNIC experts. The data collected during this first step was analyzed and supported and orientated preparation of the second step of the market assessment.
- The second step was carried out by international experts from HORUS and Salvaterra and consisted of meetings with national-scale players in Niamey (four-day mission with two experts).

The primary research consisted of qualitative interviews with representatives of key stakeholders. There were very few meetings with farmers and farmers' organizations. Pre-identification of potential financial partners was carried out based on one 1–2-hour interview per institution.

The list of structures and contacts of people surveyed is presented in Appendix 6.

The report is structured into four parts:

- **Overview of irrigated agriculture in Niger**
- **Demand for irrigation equipment finance**
- **Financing offer to support smallholder farmers' access to irrigation equipment**
- **Recommendations for a future IFC intervention.**

Parts 2, 3 and 4 end with a summary and conclusions in a view of a future IFC intervention.

2. An overview of irrigated agriculture in Niger

2.1 Hydrographic and agroecological zones suitable for irrigation

According to Hauswirth et al. (2020)[5], Niger can be divided in fifteen main hydrographic and agroecological regions, (Figure 2) including seven with a strong potential for private irrigation:

- **The Niger River and its tributaries in the regions of Tillabéri, Niamey and Dosso**, where most of the large-scale irrigation intended for rice monoculture is concentrated, using pumping stations with high-flow irrigation pumps. These flood plains and alluvial terraces, bordered by sand dunes and lateritic plateaus have hydromorphic soils and permanent access to surface water. In addition to irrigated rice, cultivation systems include off-season market gardening, fruit growing, flood recession crops and rainfed cropping systems on dune soils (millet, sorghum, cowpea).
- **The Dallols Bosso and Maouri river valleys in the Dosso and Tillabéri regions**, characterized by old inactive dry valleys of limited elevation with sandy formations, streams and alluvial valleys, carved into plateaus bounded by lateritic cuirasses. Soils are hydromorphic and clayey, and water tables are shallow (<20 m). Permanent or temporary surface water is also available. Water is thus easily drawn from wells and shallow boreholes by manual pumping or with motor pumps, and irrigated systems include cash crop gardening such as potato, cabbage, tomato, onion, sugarcane, rice, sesame, sorrel, moringa, and cassava, along with cereals and fruit systems and rainfed millet, sorghum and cowpea.
- **The Maggia Tarka in the Tahoua region**, with deep valleys retaining a lot of humidity with hydromorphic soils (gley) embedded in a vast sandstone plateau. Permanent, semi-permanent and temporary surface water is available and can be accessed through small and medium-sized dams. Ground water is also available at low depths. Agricultural activities consist of intensive irrigated market gardening (onion, tomato, tubers, vegetables), and intensive rainfed and irrigated crops in the south of the zone, including off-season systems: onion, maize, sorghum, tubers, and vegetables.
- **The Goulbi of Maradi and Goulbi n'Kaba river valleys in the Maradi region**, which are fossil valleys with heavy soils with gley and alluvial input and significant access to surface and ground water, embedded in a vast undulating plateau. Rainfed agriculture is practiced for millet, sorghum, local beans, peanuts, wanzou, and sorrel, while irrigation is used in the lowlands for a variety of crops including onion, vegetables, tobacco, sugarcane, and cassava.
- **The Koramas and Zinder basin in the Zinder region**, which are depressions and valley systems of fixed sand dunes (stabilized) with oasis enclaves. Soils are clayey in the valleys, alluvial and not very evolved in the lowlands, with a sandy to sandy-silty texture and traces of hydromorphy at depth. The water table is shallow and mobilized from ponds and shallow wells, particularly for private irrigation. Agriculture in the lowlands is mainly market gardening (cabbage, onion, potato, bell pepper, sugarcane), and fruit growing (date palms, citrus, mango).

[5] Hauswirth D., Yaye H., Soumaila A.S., Djariri B., Lona I., Abba M. B. (2020). *Appui à la formulation concertée de la SPN2A pour la République du Niger : Identification et évaluation des options d'agriculture intelligente face au climat prioritaires pour l'adaptation face aux changements climatiques au Niger (Volume 1)*. Ministère de l'Environnement, de la Salubrité Urbaine et du Développement Durable. Ministère de l'Agriculture et de l'Elevage. Conseil National de l'Environnement pour un Développement Durable. Haut-Commissariat à l'Initiative 3N. AFD. Facilité Adapt'Action. Niamey, Niger. Baastel - BRL - ONFI. Brussels, Belgium.

- **The Komadougou River and the basins and lands of Lake Chad, close to Diffa**. Located in a sedimentary basin with a wide sandy plain bordered by dunes and plateaus with an altitude of less than 300 m, they have hydromorphic soils, available surface and underground water (<10 m), ideal for off-season crops. Crop systems in the area include rainfed or recessional systems (sorghum, cowpea and sesame, wheat and maize), intensive rice on irrigated perimeters and private irrigated market gardening systems (bell pepper, onion, potato), particularly in the Komadougou.
- **The Aïr system and the oasis basins in the Agadez region**. Located in moist valleys with light, sandy to silty-sandy soils between highlands and isolated granite peaks, these zones benefit from shallow alluvial water tables (<10 m) flowing temporarily in the koris (temporary rivers), while abundant groundwater resources are available at significant depths. Crop systems in the area consist of intensive, irrigated gardening, with production for self-consumption and marketing.

  Overexploitation of the water table in the Aïr region has led to the drilling of increasingly deep boreholes (more than 50 m). This situation is also affecting the regions of Maradi and Tahoua, where farmers are using counter wells to draw water in some areas.

The table depth has been evaluated in most of the country and is presented in the map below (

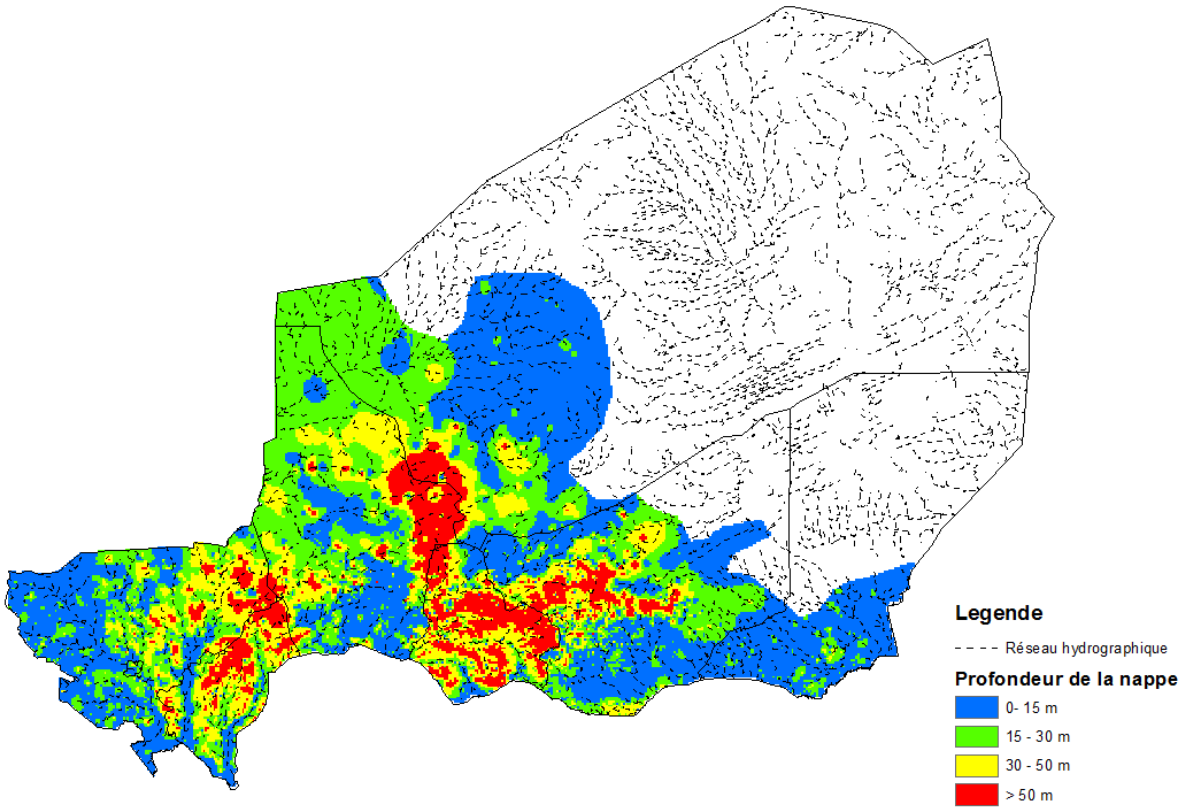


Figure 1: Map of table depth in Niger (DGGR 2015)[6]

[6] Ministère de l'Agriculture – Direction Générale du Génie Rural 2015. *Évaluation du potentiel en terre irrigable du Niger*.

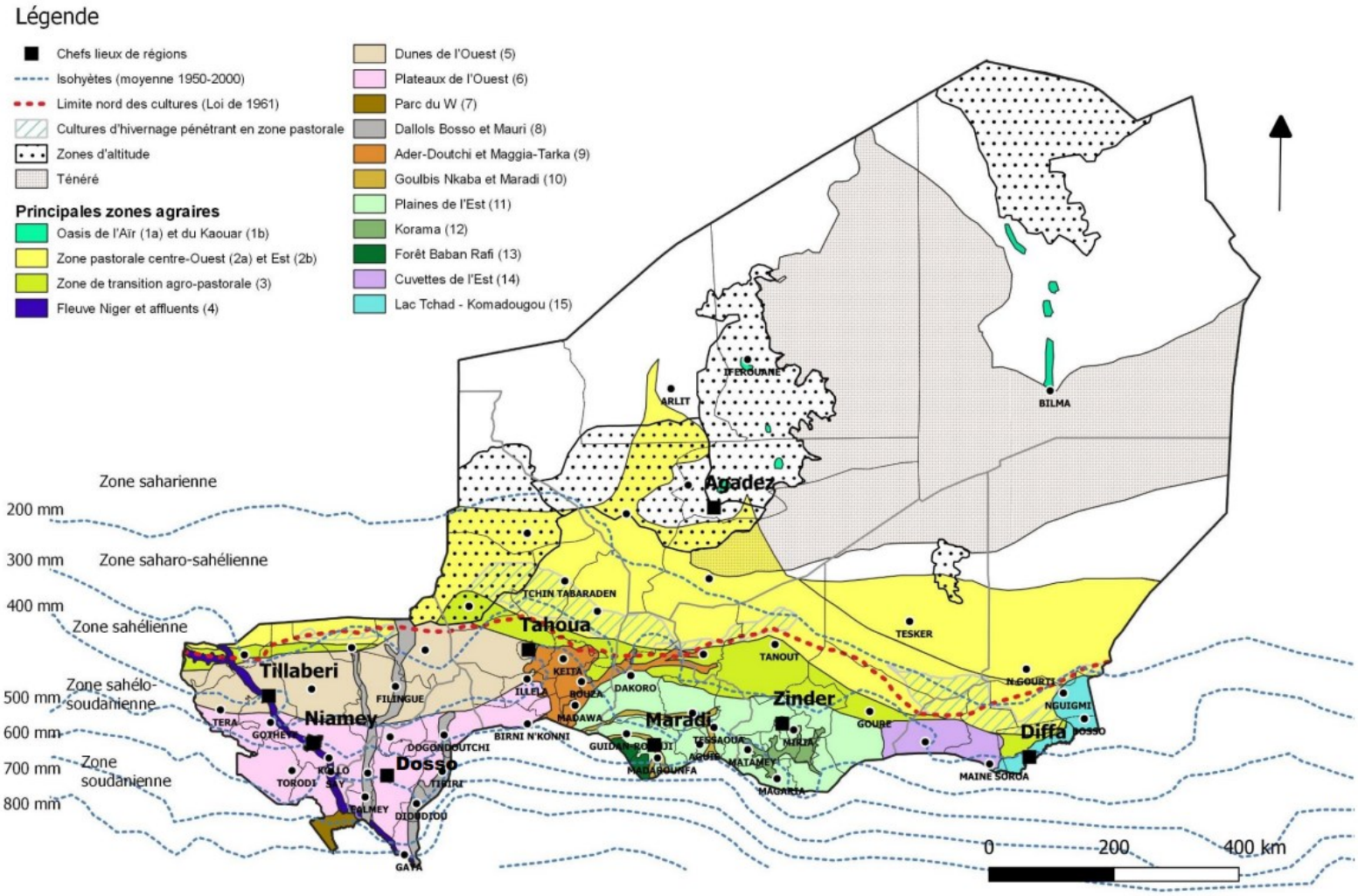


Figure 2: Map of Niger's agroecological zones. Source: Hauswirth et al. 2020.

2.2 Segmentation of commercial production

NB: In this report, commercial farming is used in opposition to subsistence farming, whereas smallholders are defined as farmers cultivating small surfaces under 2 ha. So, a commercial smallholder is a farmer with limited cultivated superficies but selling a significant part of its production.

(1) Irrigated agriculture in all the hydrographic and agroecological regions described above is carried out by different types of producers. Most of the farmers are involved in subsistence agriculture, but commercial agriculture is also important in all irrigated areas.

The most common form of characterization of production systems is based on whether the actors have access to production factors: technical and financial capital, labor, and land. The combination of these three factors helps determine eight types of production systems:

Type	Name	Access to:		
		Capital	Labor	Land
1	The wealthiest	Yes	Yes	Yes
2	Well-off tenant farmers	Yes	Yes	No
3	Employers	Yes	No	Yes
4	Private investors	Yes	No	No
5	Producers limited by access to capital	No	Yes	Yes
6	Workforce providers	No	Yes	No
7	Poor landowners	No	No	Yes
8	The most vulnerable	No	No	No

(2) In all the regions visited, most of the commercial farmers are smallholders belonging to the "Producers limited by access to capital" category, who are dependent on commercial intermediaries.

These smallholders (they generally cultivate areas under 2 ha) therefore represent the bulk of the potential market for irrigation equipment. Their lack of working capital implies that they are generally unable to assume all production costs for a campaign, which means that they are dependent on campaign pre-financing solutions (see 3.3.1 (3)).

This situation means that this category of producers finds it very hard to invest in productive equipment, such as irrigation equipment.

(3) Private farmers with access to capital are good candidates for higher-end irrigation systems. Their numbers are however not enough to provide a sustainable market for finance mechanisms targeting irrigation equipment.

These individual private famers are typically professionals in the field of agriculture (retired public servants, for example), with prior knowledge of irrigation. Such individuals have access to formal ownership of the land (generally less than 10 ha) and invest in equipment, either with their own funds or with some kind of support from the State, NGOs or other partners. These farmers can benefit from bank loans or small credits from micro-finance structures, provided that they present guarantees (see 3.3.1 (1)).

Individual farmers are more numerous in the Ader Doutchi and Maggia valleys, along the Komadougou, the Dallols, the Goulbi of Maradi, and in the Aïr and Koroma areas, and are generally producers of onions, lettuce, tomatoes, potatoes, squash and peppers. The agricultural services do not generally have accurate data on their numbers due to a lack of monitoring resources.

2.3 Agricultural organizations

(1) The structuration of agricultural production in Niger can be divided in three hierarchical levels: producer groups, cooperatives and umbrella organizations.

- **Producer groups** group producers from the same village or neighborhood who exploit together a piece of land and agree on internal rules regarding the acquisition and use of community equipment, the maintenance of structures, and the payment of contributions to meet certain collective expenses. They can be gender-specific (composed exclusively of women) or mixed.

  Producers groups do generally not own the land, which is put at their disposal by the village chief or a willing owner. Both parties are bound by a contract, renewable every few years, which is secured by an official certificate issued by the Village or Communal Land Commissions (COFOB or COFOCOM) and registered in the Departmental Land Commissions (COFODEP).

- **Producer cooperatives** are producers groups on a larger scale, where individual owners of several sites join together to better defend their interests and access certain support or facilities that they cannot obtain on their own. Members of cooperatives, like those of groups, can benefit from exemptions from certain taxes and duties when they import equipment and materials under the conditions provided for by the law. Cooperatives are mostly found in the Agadez, Maradi and Tahoua regions.

- **Umbrella organizations** are unions or federations of cooperatives, which support their members through the provision of services, such as capacity building, and the organization of product collection, etc. They can be of regional or national scope. These organizations are a common entry point for funding and other kind of support provided by the State and other financial and technical partners.

  There are 13 umbrella organizations, which are grouped together in the Plate-Forme Paysanne du Niger (PFPN, Peasant's Platform of Niger. Out of these 13 organizations, 4 are especially relevant with respect to market gardening and small-scale private irrigation:

- The *Fédération des Coopératives Maraîchères* Niyya (FCMN, Niyya Federation of Vegetable Gardening Cooperatives),
- The *Féderation des Unions de Groupements Paysans du Niger Mooriben* (FUGPN, Mooriben Federation of Unions of Peasant Groups of Niger),
- The *Confédération Coopérative Paysanne Horticole du Niger* (CCPHN, Confederation of Peasant Horticultural Cooperatives of Niger), and
- The *Association Nationale des Coopératives des Professionnels de la Filière Oignon* (ANFO, National Association of Cooperatives of Onion Professionals)

(2) Other type of actors have a structuring effect on the organization of production: the DAC/POR, the regional chambers of agriculture, commercial intermediaries, and development projects.

- **The DAC/POR** is the State administration in charge of the control and organization of producer groups, cooperatives, and umbrella organizations. It stands for *Direction de l'Action Coopérative et de la Promotion des Organisations Rurales* (Directorate of Cooperative Action, and Promotion of Rural Organizations). The DAC/POR supports the empowerment of cooperatives and producer groups through technical and legal advice, fundraising, project elaboration and conception, etc.

  The DAC/POR has been instrumental in the "cleaning up" of the cooperative ecosystem: in 2011, over 54,000 organizations were registered in Niger, including an overwhelming majority of non-functional "paper cooperatives". They are now 5,632 such organizations, duly licensed with updated statuses and documentation, and a valid bank account financed by membership fees. Moreover, every cooperative must hold specific reserve and guarantee funds, and a special account for capacity building.

  According to the DAC/POR, the most relevant and promising cooperatives for market gardening at regional level are the following:

Region	Organizations	Corresponding products
Niamey/Tillabéri	Local sections of the FCMN Niyya in Bonkoukou (potato, cassava) and Tillkaina (onion, manioc, melon, limon)	Potato, cassava, onion, manioc, melon, limon
Dosso	Local sections of the FCMN Niyya in Doutchi (potato), Tibiri (moringa, watermelon and cassava), Dioundiou (sugarcane, moringa, cassava, tree crops), Gaya (onion, citrus, sweet potato, tree crops), Birni Ngaoure (cassava, sugarcane, pumpkin).	Potato, onion, moringa, watermelon, cassava, sugarcane, sweet potato, tree crops, squash
Tahoua	Fédération Régionale de la Filière Oignon (FRFO) Union des producteurs de manioc Konni Union des producteurs de tomate Dogawara	Onion, cassava, tomato

Maradi	Fédération des Unions Maraîchères et Agricoles (FUMA) Fédération SAA	All vegetables and tree crops
Zinder	Local sections of the FCMN Niyya in Wacha (cassava, sugarcane), Bandé (tomato, sugarcane, moringa, sesame), Meria (all vegetables and tree crops) and Guidimouni (all vegetables and tree crops)	All vegetables and tree crops
Diffa	Fédération Régionale des Producteurs de Poivron (FRPP)	Bell pepper, wheat, paprika
Agadez	Fédération Régionale Maraîchère Coopérative (FRMC)	Onion, garlic, potato, citrus

- **The Regional Chambers of Agriculture (CRAs)** are coordinated by the *Réseau National des Chambres d'Agriculture* (RECA), under the administrative supervision of the DAC/POR. The RECA and the CRAs are present in all 8 regions of Niger and provide a variety of services to agricultural professionals and producer organizations, including, agricultural advice (management advice on the farm, phytosanitary advice, etc.), training of young farmers, support for access to agricultural credit, but also support for associations of water users or market infrastructures.

  CRAs are "public establishments of a professional nature" with missions of general interest but they are not State organizations.

- **Commercial intermediaries** organize the marketing of agricultural products. They operate from platforms where producers group their production. Despite the efforts made by the projects that helped install these platforms (PRODEX, PRODAF, ASAPI, etc.), and the efforts of the CRAs which regularly disseminate information on agricultural markets and prices, commercial intermediaries are the real price makers for all value chains, and they generally apply high profit margins.

  This is one of the limitations of the cooperative model, as it exists in Niger: farmers generally sell their products directly to commercial intermediaries (and not through their cooperative), so their power to negotiate is strongly limited. This is further reinforced by the fact commercial intermediaries propose pre-financing to cover the farmers' operational costs (see 3.3.1).

- **Development projects** are an important part of the agricultural landscape in Niger. Their proliferation has been both a great opportunity to innovate and spread small-scale irrigation solutions across the country, and an obstacle to creation of an autonomous market for irrigation equipment.

  World Bank pioneer projects such as the Pilot Project to Promote Private irrigation in Niger (PPIP, 1996-2001) and the Private Irrigation Promotion Project - Phase 2 (PIP2, 2003-2008) showcased the potential benefits of small-scale private irrigation, and inspired a lot of subsequent projects funded by a variety of technical and financial partners including the European Union, GIZ, ACID, LuxDev, and Millenium Challenge Corporation.[7] These projects fully or partly subsidize irrigation equipment for the benefit of farmers. When the equipment is only partly subsidized, the farmer is

[7] Ehrnrooth, A., L. Dambo and R. Jaubert. 2011. *Projets et programmes de développement de l'irrigation au Niger (1960-2010): Eléments pour un bilan.* Direction du Développement et de la Copération, Confédération Suisse, Lausanne, Switzerland. 115 p.

encouraged to apply for a loan in order to fill the financing gap (the "matching grant system" – see 4.3).

Although these projects (and their equivalent in neighboring countries) have been successful in extending the use of new irrigation technologies and allowed for the creation of solid supply and demand for basic equipment such as motorized and manual pumps, they have also been responsible for creating unfair competition mechanisms between subsidized project and commercial initiatives, resulting in some cases in opportunistic behaviors or a wait-and-see attitude among farmers[8].

This situation notably motivated adoption of the Strategy for Small-scale Irrigation in Niger (SPIN) in 2015 with the support of the GIZ. The SPIN notably provides a common framework for all development projects supporting irrigation, including common rules for the selection of project beneficiaries. The SPIN clearly defines the breakdown of the respective shares of grant, credit and producer's contribution to finance irrigation systems (see 3.3.2 (3)).

2.4 Small-scale Irrigation systems

The irrigation systems are roughly the same in all regions, with two main categories: pressurized systems and unpressurized systems (irrigated perimeters).

2.4.1 Irrigated perimeters

Irrigated perimeters are permanent collective infrastructures of up to 600 hectares, generally managed by the State through the National Office for Hydro-Agricultural Development (ONAHA).

They generally need a permanent source of surface water, like the Niger River in Niamey, Tillabéri and Dosso, or the Komadougou River in Diffa. In Zinder and Tahoua, such perimeters are built around dams to compensate for insufficient surface water availability. Perimeters also exist in Agadez and Maradi, but they are fed by boreholes of varying depths.

Irrigated perimeters are generally used for rice cultivation for farmers gathered in cooperatives, but some of them are used for vegetable or tree crop production. This is the case in Niamey, Agadez and Dosso for example. Another frequent situation is inclusion of vegetable gardening areas within rice perimeters. In this case, vegetable gardening is commonly practiced by the spouses of cooperative members.

Water is generally fed to irrigated perimeters by gravity or through pumping. Motor pumps (or pumping stations for the largest perimeters) pour the water into a network of irrigation channels. Distribution can be carried out directly through water gates to flood individual lots (this is generally the case for rice cultivation, but rather exceptional in vegetable gardens), or by filling individual ponds. In this latter case, water is then harvested manually with watering cans, then sprinkled over the crops. Two watering cans are used simultaneously.

[8] Sonou, M. and S. Abric. 2010. *Capitalisation d'expériences sur le développement de la petite irrigation privée pour des productions à haute valeur ajouté en Afrique de l'Ouest*. Practica Foundation, Papendrecht, The Netherlands, 139 p.

2.4.2 Pressurized systems

(1) Pressurized systems are generally used outside irrigated perimeters and are the commonest type of irrigation systems found in medium-scale private farms.

In such systems, water is carried through a pressurized network of hoses or pipes and distributed to the plants using various techniques.

- **Water collection** generally involves pumping, either from rivers, ponds and lakes directly when surface water is available, or from wells and boreholes tapping into groundwater. Depending on the depth of the water table, simple motor pumps, solar-powered electric pumps and hybrid pumps can be used. For deeper wells (>20 m), immerged electric pumps are required, and these can be powered by solar or fuel generators.

  Immerged pumps may be not powerful enough to draw water out of deep boreholes, in the deepest water tables (in the Agadez region for example). In these cases, a secondary well is used as a "relay": a first immerged pump in the deepest borehole collects the water and stores it in a secondary well shallow enough for a second pump to draw it out.

- **Pressure** can be obtained either directly (if the output pressure of the collection pump is high enough to feed the whole system), or indirectly through elevated storage basins or tanks.

- **Transport and distribution to plants** can be carried out in various ways, depending on the availability of materials and technical support to farmers, and their financial capabilities, etc.

  - **Californian and semi-Californian systems** are widespread low-pressure systems, and relatively easy to implement at a reasonable cost. They consist of a network of PVC pipes buried at a depth of about 50 cm. Distribution is through vertical nozzles from which the water is poured onto a solid surface (to avoid eroding the soil) and then trickles directly onto the ground.

    Despite their solid state (once buried, the pipe network is difficult to modify), Californian systems can be adapted to meet specific needs, for example, by complementing the underground distribution network with a surface network of irrigation troughs, thus extending the cultivated surface at limited cost. These "semi-Californian" systems are especially well suited for tree crops, where the spacing between the trees would make a "pure" Californian system very costly (aside from the risk of it breaking under the action of the roots). As Californian and semi-Californian systems can be made with the same PVC pipes and plumbing parts that are used for housebuilding, the availability of materials is generally not a problem, and local plumbers can be trained to build them.

    Californian systems have thus been largely favored by NGOs and development programs in Niger. Actors such as the DAC/POR and PFPN do not hesitate to recommend them as the best choice for any support program to small-scale private irrigation. Nevertheless, these systems present several drawbacks, the most important being that they are suboptimal in terms of water efficiency, especially on light sandy soils.

  - **Dripping systems** rely on a network of flexible hoses with regularly spaced outlets that allow the water to drip directly at the foot of each plant. These systems are the most water efficient and allow optimal yields.

However, there are many obstacles to the expansion of dripping systems. They are complex, fragile and expensive to implement. Moreover, as the space between the drippers depends on the crop, they lack flexibility: the only option for a farmer to be sure that their irrigation system will be able to fit all crops is to build it with minimal spacing, which involves an extra cost and implies that whenever a wider space is required, some of the nozzles will have to be plugged or a significant fraction of the water will be lost. Dripping systems also require specific parts and specialized skills to build and maintain, and neither of these resources are widely available outside Niamey.

Last but not least, as water is distributed in small quantities, the irrigation process is not "spectacular" with lots of water flowing as in Californian or aspersion systems, hence a reported reluctance of farmers to adopt this technique.

- **Micro-aspersion** systems are also relatively frequent. They range from very simple systems, which are basically performed hoses, to optimized ones like the "Hadari" systems, with specific parts that can be difficult to obtain outside Niamey.

  Micro-aspersion systems are generally more efficient than Californian systems, especially in sandy soils, but less efficient than dripping systems, due to a higher sensitivity to evaporation. They also typically require a higher pressure (1 to 8 bars), which can be difficult to obtain.

(2) The SPIN has produced recommendations to select the best-suited irrigation systems.

In addition, the SPIN has produced recommendations to select the best-suited irrigation systems according to criteria such as the nature of the soil, the depth of the water table, etc. These recommendations will probably have an impact on the dissemination of the corresponding techniques, with producers adopting them to benefit from the matching grants proposed.

(3) The costs of each irrigation system are difficult to assess and depend on many factors, such as the nature of the ground.

The investment cost into an irrigation system varies depending on the hydrographic conditions at local level, on the option taken by the farmer, from simple to elaborated irrigation technologies such as the drip, but also on the origin of the equipment:

- First, the drilling costs depend on the depth of the water table, but also on the nature of the soil, allowing or not various manual drilling techniques, much more affordable than motorized ones. Note that manual drilling techniques such as the washbore are particularly well adapted to sandy soils and widespread in Niger. In 2010, washbores costed between FCFA 25 000 and FCFA 50 000 in Niger[9].
- Second, the cost of the pump will depend on:
  - The depth of the water table, requiring or not submersible pumps or relay pumps,
  - The nature of the pump: manual, motored, electrical (solar or traditional power sources) or mixed, knowing that manual pumps are the most affordable ones but are very limiting in terms

[9] Capitalisation d'expériences sur le développement de la petite irrigation privée pour des productions à haute valeur ajoutée en Afrique de l'Ouest, 2010

of irrigated superficies, and that solar pumps are the most expensive, but do not imply any fuel cost,

- The origin and quality of the pump: European systems are the best ones but tend to be too expensive for the Nigerien market. Pumps from China or Japan, often imported through Nigeria, appear more affordable, but, for the Chinese ones, the quality highly depends on the supplying plant.

- Finally, the cost of the irrigation solution will depend on the irrigation system: Californian systems are the most affordable ones. Dripping systems are significantly more expensive and depend on the spacing of the nozzles.

"Local" solutions (solutions available in regions and directly imported by local, non-specialized providers) tend to be the most affordable, with expressed investment needs from FCFA 300 000 for a motor pump and irrigation network over 0.75 ha. Diesel Chinese motor pumps (3 to 5 hp.) can be acquired for FCFA 150,000[10] or even less.

Equipment providers based in Niamey propose more expensive solutions, however, their offers combine equipment (solar pumps and irrigation systems) with setup, technical advice and follow up. They also guarantee the respect of minimum quality standards.

In particular:

- The African Agribusiness Center proposes various irrigation solutions, including options adapted to smallholders that have been patented by the company such as the Hadari system. Price ranges of the Center are detailed in Appendix 1[11]. A smallholder with accessible water table (< 20m) would have to invest from FCFA 730 000 for a manual borehole, a gas motor pump and a Californian system on 1 ha, up to FCFA 5 m for a solar pump and a dense dripping system on 1 ha.

- Nirritech exclusively commercializes dripping systems with similar price ranges: from FCFA 2.5 to 3 m for a complete set up of a dripping system on 1 ha (without pump[12]). Nirritech associates with Solarex Energy, a local solar solution provider to propose turnkey solutions.

(4) Profitability of investments into irrigation systems also depends on the cultivated crop. The RECA is currently carrying out a compared cost/benefit analysis of the different irrigation systems for the principal market gardening and tree crops value chains.

We know from international experience that small-scale irrigation is a perfect match for vegetable gardening and tree crops. In Niger, for example, irrigation allowed some strong national and international value chains such as the onion in Agadez and Maradi to develop, and is today supporting, among others, the development of the potatoes value chain in the North (Filingué, Agadez, Talbot), or of high value counter season crops such as gumbo, tomato, bell pepper or pepper around Niamey. However, data on the costs and benefits of irrigation per cultivated crop is not available in the country.

[10] Sectorial card Oignon Maradi from the RECA's website, 2016

[11] From interview and complementary information sent by email, July 2022

[12] www.nirritech.com

Profitability of irrigation is highly linked to the selling price of the agricultural product. Yet, the marketing and production context in Niger is volatile, and overproduction has been mentioned repeatedly as a strong risk for producers. This is particularly the case for perishable crops such as tomato or salad, that cannot be stored and must be sold instantly. In this context it is important to leave producers free to experiment and shift from one production to another, depending on the fluctuations in supply and demand, market prices, logistics and marketing constraints, etc.

The RECA is currently carrying out a compared cost/benefit analysis of the different irrigation systems for the principal market gardening and tree crops value chains, that should be available by the first quarter of 2023. In any case, in this context of uncertain profitability of the investment, finding the best price vs quality ratio for an irrigation equipment will be key at farmer's level.

(5) According to surveyed experts, an experimented smallholder choosing a good quality equipment at reasonable cost will take around four years to make its investment into an irrigation system profitable.

2.5 Summary and conclusions for a future IFC intervention

Potential for private irrigation in Niger can be found in all the regions of Niger, in river valleys and wherever groundwater is available. Most Nigerien farmers are involved in subsistence agriculture; however, commercial agriculture is also important in all irrigated areas. Most commercial farmers are producers limited by access to capital, but with access to labor and land. Private farmers with access to capital are good candidates for higher-end irrigation systems. Their numbers are however not enough to provide a sustainable market for finance mechanisms targeting irrigation equipment.

Agricultural production is quite structured in Niger, with three hierarchical levels: producer groups, cooperatives, and umbrella organizations. The system has experienced an important "cleaning up" since 2011. The State administration in charge of the control and organization of these groups, the DAC/POR, is able to identify serious and well-structured organizations. However, cooperatives do not buy the production. The marketing of agricultural products is between the hands of commercial intermediaries operating from platforms where producers group their production. Development projects are also key players in the agricultural landscape in Niger.

The irrigation systems are roughly the same in all regions, with two main categories: pressurized systems and unpressurized systems (irrigated perimeters). Irrigated perimeters are permanent collective infrastructures of up to 600 hectares, generally managed by the State through the National Office for Hydro-Agricultural Development (ONAHA). Pressurized systems are generally used outside irrigated perimeters and are the commonest type of irrigation systems found in medium-scale private farms. In these systems, water collection generally involves pumping. The nature of the pump required depends on the depth of the water table. Transport and distribution to plants can be done through several options:

- Californian and semi-Californian systems, low pressure systems, easy to implement and to maintain though suboptimal in terms of water efficiency,

- Dripping systems, which are the most water efficient and allow optimal yields, but are complex, fragile and expensive to implement, lack flexibility and can face cultural barriers,
- Micro-aspersion systems, basically hoses with holes, generally more efficient than Californian systems but less efficient than dripping systems due to a higher sensitivity to evaporation. They also require higher pressure.

The costs and benefits of each system are difficult to assess and depend on hydrographic conditions at local level, as well as on farmers' choices and capacities. However, experience tends to show that for an experienced smallholder farmer involved in gardening activities, it takes around four years to make an investment into an irrigation system profitable.

This overview of irrigated agriculture in Niger provides a few key insights for a future IFC intervention.

1. Scaling up commercial irrigation in Niger doesn't require targeting a specific region of Niger.

2. The bulk of the potential market for irrigation equipment is made of commercial smallholders with access to labor and land but limited access to capital. This means most farmers are unable to cover all their operation costs, and any financing scheme targeting this population should consider this constraint (and not be limited to covering investment costs). Other groups of farmers with access to land and working capital could be included in the project, but their number would not be enough to reach the afore-mentioned critical mass. Besides, as these producers are confronted with fewer constraints, it will be easier to adapt marginally a project suited for smallholding famers with no access to capital to fit wealthiest actors.

3. It is possible to identify serious and reliable farmers' organizations in Niger. However, these organizations not being involved into commercialization constitute a constraint for them to act as key players within a financing scheme.

4. The most efficient and environmentally sustainable solution, the drip, is also the most expensive one. It doesn't seem to be very adapted to a large-scale diffusion to smallholder farmers, considering its fragility, complexity, and lack of flexibility.

5. Irrigation equipment is a significant investment for a smallholder. Low-cost initiatives and innovation limiting operation costs (such as solar-powered electric pumps) should be preferred over more sophisticated ones to ensure profitability of the investment and maximize repayment capacity of a credit at farmer's level.

6. Small-scale irrigation is best suited for market gardening and tree crops. Producers investing into irrigation equipment need to constantly adapt their crop choices to the supply and demand fluctuations in order to maintain satisfying selling prices and be able to get return on investment.

3. Demand for irrigation equipment finance

3.1 Demand for irrigation equipment

(1) Most Nigerien producers have access to land and labor, but lack financial capital and technical capacities to invest in irrigation equipment

Nigerien agriculture is primarily practiced by small farmers with low technical capacities, on small surface areas. Most vegetables and tree crops are cultivated in small plots of land of less than 10 hectares, either in individual farms or as part of a grouped cultivation plot. In this latter case, individually cultivated surfaces may be smaller, at around 0.2 hectares each.

According to the CRA officials interviewed, most small farmers have at least customary land titles issued by local land commissions. This means that the majority of farmers have access to land and are therefore eligible for credit. However, this is not true for women, who generally have reduced access to land ownership: according to custom, either women do not inherit land (customary law), or they inherit a share equal to half that of a man (Islamic law).

There are some regional variations with respect to gender participation: for example, in the regions of Maradi and Tahoua, women actively participate in market gardening and wealth creation, whereas they are almost absent in Agadez, with the exception of a few widows and other vulnerable women who exploit plots on small-scale irrigation sites (new sites in the commune of Timia, Tabelot, etc.).

These gender biases are being reduced through the creation of community-based small-scale irrigation sites for women's groups. However, despite the willingness of some local authorities to allocate land to women, they still find it hard to access land in most of the regions surveyed.

(2) In this context, simpler systems such as Californian networks are preferred over complex ones such as dripping irrigation and micro-aspersion.

The overwhelming majority of farmers cultivate with very simple irrigation systems, which are limited to water collection, while distribution to plants is done manually with watering cans or flexible hoses. This is primarily due to a lack of financial capability, with farmers unable to invest in more elaborated systems.

If they are able to upgrade their irrigation systems, farmers clearly prefer the most economic and easily available one. Californian and semi-Californian systems are thus widely preferred over micro-aspersion and dripping systems, which are perceived as costly, more fragile, difficult to implement, less flexible and harder to repair as spare parts are not so available.

Therefore, actors such as the PFPN, and various development projects such as the MCA Compact do favor exclusively Californian systems.

This doesn't mean that recent innovations can't reach smaller farmers when they meet their needs. Experience shows that solar powered electric pumps or hybrid gas/diesel fueled motor pumps can spontaneously disseminate as fossil fuels are getting more expensive and weigh heavily on operation

costs. Irrigation equipment suppliers also indicate a raising interest for micro aspersion systems like the Hadari.

3.2 Offer for irrigation equipment and agricultural inputs

(1) Agricultural inputs and equipment are distributed in Niger through two main channels: the network of registered suppliers of the Supply Center For Agricultural Inputs and Materials (CAIMA), and private establishments.

The CAIMA is a public organization founded in 1978 to ensure the availability of agricultural inputs (and especially plant protection products and fertilizers) to all producers in Niger. The CAIMA relies on a dense network of over 280 registered distributors in the country, which normally only sell products approved by the CAIMA.

In addition to CAIMA-approved suppliers, private establishments supply farmers with imported products based on partnership contracts with several large agricultural input supply groups. This market includes many actors, and a few leading companies such as GMA. Plant protection products are for example sourced in Nigeria, Burkina Faso (PROPHYMA), Togo (ANTOR), and Niamey, while agricultural seeds, are supplied by four companies: East-West Seeds, GREEN Niger, PHYTOSEM, and SOGEBA

According to stakeholders interviewed, the reform of CAIMA, which is considered by farmers to be a “liquidation” or “privatization” of the organization, has resulted in a disappearance of the distinction between CAIMA-approved and independent private suppliers. The sharp increase in fertilizer prices and stockouts of approved products that followed the reform has thus led CAIMA-approved dealers to rely on unapproved fertilizers imports from Nigeria and Libya (Agadez).

(2) The corresponding distribution network for agricultural inputs and equipment is relatively dense, but the availability of materials and equipment needed at the right time and an affordable price is a major challenge

According to Hauswirth et al. (2022)[13], most farmers at national scale identify suppliers for agricultural inputs and equipment within their department or municipality, although only 20% of farmers have direct access to those supplies in their village. The same study identifies stockouts and untimely deliveries, on one hand, and high prices and the lack of financial capabilities, on the other as the two major constraints famers have to overcome to get access to the required equipment and supplies.

Established suppliers can sell on credit to producer organizations and individual farmers, with recovery rates close to 100%, They are also able to provide technical advice. However, competition from the informal sector and the low incomes of farmers make this market very risky. This favors the involvement of commercial intermediaries which control the entire input supply chain up to the marketing of products.

[13] Hauswirth D., Yaye H., Soumaila A.S., Djariri B., Lona I., Abba M. B. (2020). *Appui à la formulation concertée de la SPN2A pour la République du Niger : Identification et évaluation des options d’agriculture intelligente face au climat prioritaires pour l’adaptation face aux changements climatiques au Niger (Volume 1)*. Ministère de l’Environnement, de la Salubrité Urbaine et du Développement Durable. Ministère de l’Agriculture et de l’Elevage. Conseil National de l’Environnement pour un Développement Durable. Haut-Commissariat à l’Initiative 3N. AFD. Facilité Adapt’Action. Niamey, Niger. Baastel - BRL - ONFI. Brussels, Belgium.

(3) Producer organizations are key actors to get access to agricultural inputs and equipment

Producer organizations are relay points for the distribution of agricultural inputs, either directly or indirectly through supply agreements with economic operators. Some of them manage to meet the demand of farmers during each agricultural season, but most report difficulties supplying their members during each season. The lack of financial and technical capacity is generally mentioned as the main reason for this.

In Agadez, producer organizations, notably the FRUSCA, are efficient platforms for supplying farmers with agricultural inputs. They periodically establish contracts with approved distributors of fertilizers and plant protection products (with the financial support of Banque Atlantique in particular). In contrast to other regions, however, commercial intermediaries play a key role in this scheme, either directly or through their participation in cooperatives and umbrella organizations, to ease the weak financial capacities of approved input providers.

(4) CRAs are strong partners to support producer organizations in accessing irrigation, with acknowledged technical capabilities.

In all the regions investigated, CRAs were led by qualified staff, with a high sense of commitment and a clear vision of their mission. The current role of the CRAs is becoming increasingly decisive due to the failings of the State's decentralized technical services. The CRAs provide training for farmers, prepare credit applications, provide technical monitoring of credit operations, and support producer organizations. Most technical innovations are evaluated and disseminated by the CRAs in all the regions investigated.

The technical support of the CRAs and certain firms has thus enabled producer organizations to begin to adapt irrigation systems to market-oriented farming systems. The use of hybrid carburetors (gasoline and gas) and solar powered pumps is spreading, especially in the Agadez region where technical innovation initiatives are more individual than community based.

(5) Simple irrigation equipment is readily available across the country, but quality concerns and the possibility of fraud must not be overlooked

Several decades of projects supporting small-scale irrigation and access to water in Sahel countries has favored the emergence of an active market for simple irrigation equipment. The latter is thus widely available through CAIMA-approved and private suppliers.

This simple equipment includes different types of immerged pumps and motor-powered pumps, including electric models and others functioning with gas, diesel or hybrid carburetors. Other inputs such as solar panels, batteries, PVC pipes and plumbing parts might be more difficult to access, but they are still quite easy to find at regional level.

The quality of this equipment and inputs is a concern regularly expressed by producer organizations and input providers. One of the most frequently mentioned factors is that illegally imported items from Nigeria, available at lower prices, but less resistant, are on the market. Interviewees from the SPIN and the PFPN also mentioned a risk of fraud within the framework of development projects, including those

carried through producer organizations. This fraud relies on overestimation of material costs in the project budget, while lower-quality inputs are acquired at a lower cost.

(6) The offer for higher-end, specialized irrigation systems is still centered around Niamey and only targets development programs and the wealthiest farmers

Another effect of the continued support for small-scale irrigation in Niger since the 1990s has been the emergence of actors specialized in the provision of irrigation services and technologies, ranging from equipment importers, such as Nirritech, the official importer of Netafim equipment in Niger, to innovative entrepreneurs proposing automated, optimized dripping systems, such as Tech Innov'.

This ecosystem of entrepreneurs has shown considerable ability in developing technical solutions adapted to the Nigerien context. While some providers, such as Nirritech, remain "traditional" in their offer and "only" provide state-of-the-art dripping and micro aspersion systems, others like Tech'Innov seek to be disruptive and propose technological innovations at various levels.

These solutions include, for example, cellphone-controlled automated dripping systems with agrometeorological sensors to calculate optimal irrigation requirements.

Most of these higher-end systems have two major drawbacks in common that disqualifies them as sustainable solutions for large-scale commercial dissemination: they require a) substantial upfront investment, and b) considerable technical capacity or trained specialists for their implementation and maintenance, both which are not available outside Niamey and its surrounding region.

The African Agribusiness Center is an interesting structure because it proposes low cost – low tech innovations specially designed to fit the needs of smallholder farmers such as the Hadari system or the Sehaiki (mobile solar panels allowing the owner to reduce the risk of theft and enabling producers to use the electricity for domestic use).

These innovative systems have been widely supported by technical and financial partners and development projects (which still represent a major outlet and source of funding for the corresponding entrepreneurs), but their commercial market for this offer is limited to a small number of private farmers, namely those that rank among the wealthiest in the country. The companies distributing these solutions often lack working capital to import equipment in significant quantities.

3.3 Access-to-finance trends for irrigation equipment

3.3.1 Current access to credit for farmers

(1) Direct access to formal credit for irrigation is currently limited to a few privileged farmers or to the intervention of projects and programs. Access to working capital loans is also still very restricted.

Most farmers remain excluded from direct access to formal credit, with noticeable exceptions:

- Private farmers that have tangible guarantees or regular income from other sources (salaried workers, liberal professions, pensioners) generally manage to access credit for irrigation equipment if they are able to go to a bank and submit a credit request, and if they do not live too far from a bank branch.
- Smallholders can sometimes access loans from MFIs. However, the limited amounts and durations of these loans do not enable them to invest in irrigation solutions.
- Vulnerable populations, especially young people and women, but other types of farmers as well, sometimes have access to projects and programs that offer fully or partially subsidized equipment. When the subsidy does not cover 100% of the need, the project supports them in submitting credit requests to banks or MFIs (see 4.3).

NB: Details of credit characteristics (eligibility criteria, guarantees, interest rates) are presented in 4.2.

(2) Cooperatives are a major channel enabling small producers to get access to credit. The DAC/POR is already working with the RECA, the BAGRI and umbrella organizations to foster financial inclusion in the agricultural sector. However, they do not handle mid to long-term credit at present, which limits their capacity to be channels for irrigation finance.

In all the regions surveyed, cooperatives and unions have acquired experience in credit fund management. Typically, the cooperative will borrow from the bank and grant the funds to their members, in the form of inputs or small equipment (in-kind credit). It will get repaid during the crop campaign from deductions from the production sale amount. Cooperatives typically charge interest for this service, but this interest appears to be limited (< 12% per year).

The DAC/POR, the RECA and the BAGRI are currently working together with umbrella organizations to reinforce the integration of producer organizations to the banking sector.

This has led to a mutually beneficial situation, where farmers' membership in a producer organization is motivated by this structure's ability to mobilize credit funds for its members, while management of these credit funds allows producer organizations to collect contributions from their members and to strengthen themselves.

In the context of a weak microfinance sector, and with cooperatives already involved in campaign prefinancing, a solution to upscale access to irrigation on credit on Niger could be to rely on cooperatives to manage credit funds received from banks and propose equipment on credit to their members. This would present the advantage of a lower credit cost for farmers. Moreover, the cooperative could buy the equipment in bulk and negotiate prices.

However, cooperatives only manage short-term credit (less than one year), which critically limits their capacity to support investments. The Consultant did not identify any cooperatives that have proposed its members irrigation systems on credit. The capacities of producer organizations must not be overestimated: most administrative boards still comprise individuals with a level of instruction that is insufficient. The capacity of each cooperative to deal with irrigation equipment credit should be cautiously assessed. Especially, as cooperatives don't buy production in Niger, their capacity to recover the funds from farmers is critical.

(3) Commercial intermediaries across the country have developed short-term prefinancing schemes to lock in their sourcing.

Commercial intermediaries very often propose in-kind prefinancing to their smallholder providers: provisions, inputs, fuel, etc. At the end of the campaign, the farmer must sell his/her production to the trader at a price fixed by the latter. The commercial intermediary deducts the amount of prefinancing and other commercialization charges, then divides the balance into thirds: two thirds go to the trader and one to the farmer. This system tends to keep farmers dependent on the trader and doesn't allow them to invest in their farms and grow their activities. However, it remains the major access route to prefinancing for smallholder farmers in Niger.

In Agadez for example, a commercial trader from FRUSCA that was surveyed works with 450 farmers and prefinances them during each campaign for a total amount of USD 1.25 m. He generally gets credit from Banque Atlantique to cover up to USD 0.8 m of this prefinancing. Several commercial traders have already access to short term credit from banks, collateralized by physical assets, especially in the Agadez region.

Commercial intermediaries own the capital, so they tend to control all the upstream value chain. For example, producer organizations in the Agadez region appear to be better structured with greater financial capacities. However, these organizations are generally held by commercial intermediaries (that are also large-scale farmers) who have vested interests in informal financing schemes and are therefore reluctant to promote formal credit to farmers. According to a Banque Atlantique staff from the Agadez branch, the agricultural sector is a real business opportunity for banking institutions in Agadez, with bank deposits from commercial intermediaries amounting to several billion CFA francs per year.

(4) In some regions (Maradi, Tahoua), cash transfers from migrant workers ("*exodants*") are significant sources of finance for smallholder farmers.

In Maradi and Tahoua, the CRAs estimate that more than 60% of farm financing comes from cash transfers from migrant workers.

3.3.2 Irrigation credit needs and expectations

(1) Irrigation systems constitute a significant investment, creating credit needs among most farmers.

As stated in 3.1 (2), financing needs typically arise when a farmer wishes to invest in an automated irrigation system, though some of them would need credit simply to dig a well. The investment need for a smallholder farmer will typically fall between FCFA 500,000 and 1.5 m (USD 700 – 2,300).

(2) In most parts of the country and especially in Dosso and Maradi, as well as around Niamey, people are used to receiving subsidies for equipment. Matching grants are key to limiting repayment periods.

Some of the financial institutions' and projects' representatives interviewed during the study such as BAGRI's agricultural credit manager note that people are used to subsidies/matching grants and would not invest if they didn't have access to such funds. Others, such as Yarda Tarka Maggia's CEO, underline that the selection process can be cumbersome and that farmers would be ready to invest without any grants, which would be more flexible.

In any case, given the time needed to make investment in irrigation equipment profitable (see 2.3.2 (2)), the existence of a matching grant appears to be a prerequisite to limit the irrigation credit duration to two years, which is already more than what some financial institutions currently offer (see 4).

NB: The matching grant mechanism is detailed in 4.3.2.

(3) Microfinance institution interest rates or even those of banks are often stated as a major issue by the stakeholders surveyed. However, these should be put in perspective with the prefinancing model proposed by commercial intermediaries.

Farmers' representatives and development partners always cite interest rates, including banks' interest rates, as a major constraint to agriculture credit. In the Consultant's experience, interest rates are rarely a blocking aspect for farmers, which prioritize effective access to credit. A formal credit, even at a 24% annual rate, is a more affordable albeit riskier alternative for smallholders than the prefinancing model proposed by commercial intermediaries.

Credit conditions and especially interest rates provided by MFIs are detailed in the supply side analysis.

(4) Two factors could explain the maintenance of the commercial intermediaries' abusive system:

- **Lack of financial literacy, of awareness regarding formal financial institutions,**
- **High risk aversion from farmers and low confidence in their repayment capacity.**

Most smallholder farmers, especially those living in remote rural areas, who remain out of reach of formal financial services, either are not aware about formal financial solutions, or assume they wouldn't be eligible. Many of them are afraid of taking formal credit because they think they don't make enough money to be able to repay a loan. Their revenue, within the prefinancing scheme proposed by commercial intermediaries, is indeed very low.

(5) Religion has a significant impact on credit demand. However, it does not appear to be an impediment in most regions.

In Agadez, people are reluctant to take on interest-bearing credit for religious reasons. Some women's groups in Niamey also raised this issue. However, most farmers accept interest-bearing credit. According to key stakeholders interviewed in this region, the idea of people being wary of interest-

bearing credit could be purposedly nurtured by commercial intermediaries, who see formal credit as a threat to their activity (interviews with bank and projects/program representatives).

3.4 Summary and conclusions for a future IFC intervention

Most Nigerien producers lack technical capacities. Hence, simpler systems such as Californian networks are preferred over complex ones such as dripping irrigation, mainly for technical concerns, and also for financial ones.

Access to agricultural input and equipment is controlled at State level by the CAIMA. However, stockouts and untimely deliveries on one hand and lack of financial capabilities on the other hand favored the emergence of private networks, often controlled by commercial intermediaries. A significant number of well-structured producer organizations also successfully took over the distribution of inputs and small equipment. With technical support from the CRAs, some of them begin to adapt irrigation systems to market-oriented farming systems. Availability of irrigation equipment is ensured across the country, with simple, low-cost equipment distributed by CAIMA-approved or private suppliers. Quality is however a concern. The offer for higher-end, specialized irrigation systems is still centered around Niamey and only targets development programs and the wealthiest farmers. It is provided by a few players lacking working capital to import equipment in significant quantities.

Although development projects have been successful in extending the use of new irrigation technology and allowed for the creation of solid supply and demand for basic equipment, they have also been responsible for creating unfair competition mechanisms between subsidized project and commercial initiatives, resulting in some cases in opportunistic behaviors or a wait-and-see attitude among farmers.

Direct access to formal credit for irrigation is currently limited to a few privileged farmers or to the intervention of projects and programs. Access to formal agricultural credit in general remains very restricted. Cooperatives and commercial intermediaries are largely involved in input prefinancing, however, prefinancing conditions proposed by commercial intermediaries appear quite predatory. Neither cooperatives, nor commercial intermediaries propose mid to long term prefinancing (no more than one agricultural campaign).

Access to credit would be required to unlock access to private irrigation in Niger. For a smallholder farmer, the investment need will typically fall between FCFA 500,000 and 1.5 m. Because of habits from past development projects, some farmers will expect subsidies to support their investment into irrigation equipment. Considering the typical return on investment period of irrigation equipment, subsidies are also precious tools to shorten a potential credit duration. Even if often presented as a constraint by development partners and/or farmers' representatives, microfinance interest rates do not appear to be a major blocking aspect, neither is religion. On the demand side, awareness, and accessibility of formal financial offers, as well as lack of confidence of farmers in their repayment capacities are more likely to be the main constraints.

A few conclusions from the demand-side analysis can be drawn for a future IFC intervention:

1. Simpler systems such as Californian networks are preferred over more complex systems. Their availability is ensured all around Niger, with quality issues. Only working with a few Niamey-based irrigation equipment providers is likely to hinter the development of a large-scale irrigation value chain.

2. Support from the RECA/CRAs would be key to guarantee the quality of irrigation equipment on the field. They could also orientate both farmers and financial institutions on identifying the most suitable equipment considering the characteristics of a specific farm or on the right crops to focus on at a specific moment.

3. Development projects have had both positive and negative consequences on the needs and expectations of farmers for irrigation equipment credit. Partial grants allow farmers to repay such a credit on a limited period. IFC will have to seek a good coordination with existing or future projects linked to small-scale irrigation.

4. Though the commercial intermediary system doesn't seem to be a fair system to encourage, cooperatives could be channels to distribute credit to smallholder farmers. However, they are likely to lack capacity to handle mid to long term equipment credit.

5. Smallholder farmers not only lack funds for investing into irrigation systems, but also lack the working capital to carry out their activity. This situation is mostly responsible for their dependency on commercial intermediaries. In this context, financing the equipment alone is not a viable option.

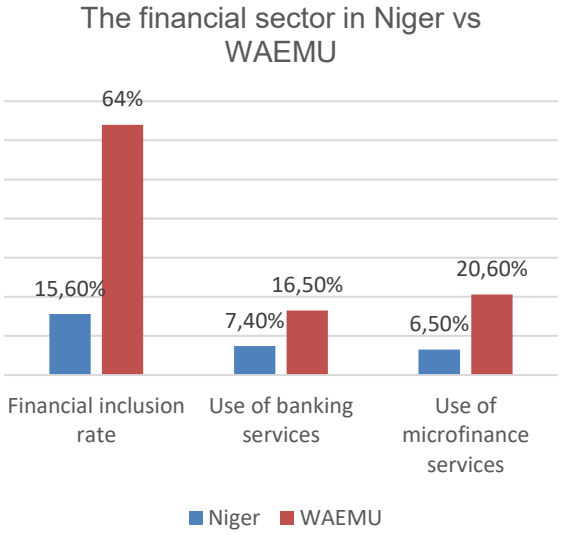
6. As most smallholders are still very far from formal financial institutions, proximity financial providers such as MFIs and especially the "SACCOs" could better fit the demand. This is also an argument to consider financing options through farmers' cooperatives.

4. Financing offer to support smallholder farmers' access to irrigation equipment

4.1 The Nigerien financial sector

(1) Niger lags behind other WAEMU countries in terms of financial inclusion and has a poorly developed financial sector.

Niger is the lowest-ranking WAEMU country in terms of financial inclusion with a 15.6% overall rate of use of financial services compared to an average of 64% for the WAEMU region (this rate includes the use of banking and postal services, microfinance and electronic money). In 2020, Niger had a 7.4% use of banking services and 6.5% use of microfinance services compared to 16.5% and 20.6% respectively at regional level (BCEAO, 2020). At the end of 2020, the total assets of credit institutions represented only 4.2% of the WAEMU total for a population representing almost 20% of the sub-region's population (BCEAO, 2020).



(2) The banking sector is underdeveloped, although it is on a growth trajectory and improving its portfolio quality.

Niger had 14 banks and three financial institutions at the end of 2020, among which one public agricultural development bank, the BAGRI. The complete list of banks is presented in Appendix 3.

The banking sector is relatively concentrated, with four banks (SONIBANK, BOA, BIA, ECOBANK) accounting for 60% of the sector's total assets. The BAGRI is the fifth one in terms of assets (see Appendix 3). Though underdeveloped, the Nigerien banking sector is on a growth trajectory (+12% in outstanding volume of loans in 2020 compared to 8.3% for WAEMU), and portfolio quality at sector level has improved significantly, with a bad debt rate of 12% at end 2020 versus 17.3% at end 2018.

The banking sector is characterized by weak geographical coverage. The network is largely concentrated in Niamey, with more than 50% of bank branches for only 7% of the population (internal resources, 2021). Outside of Niamey, the branches are only located in the country's main cities: Zinder, Maradi, Tahoua, Agadez, Dosso, and Tillabéri. At end 2017, the branches were located as follows:

	Branches	Branches / 100,000 unhabitants
Agadez	12	1.85
Niamey	95	6.95
Maradi	15	0.32
Zinder	11	0.22
Tahoua	15	0.33
Dosso	11	0.39
Diffa	3	0.38
Tillabery	7	0.19
TOTAL	**169**	**0.72**

Sources: BCEAO, National Strategy of Inclusive Finance, National Institute of statistics, Consultant's calculations

(3) The Nigerien microfinance sector has suffered from financial embezzlement and financial difficulties. It is still in a recovery process, with major actors under interim administration.

In Niger, as in all WAEMU countries, microfinance institutions (MFIs) are called "Services Financiers Décentralisés" (SFDs). Niger had 37 licensed SFDs at the end of 2021, compared to almost 300 at the beginning of the 2000s. Four of them are institutions under Art. 44[14]: ASUSU, Taanadi SA, ACEP, and Capital Finance. The microfinance sector is in a consolidation phase, with licenses for more than a hundred MFIs having been withdrawn since 2010. Moreover, it is facing a major crisis. In 2018, industry giant ASUSU (representing more than 50% of the market) was placed under interim administration following governance issues that led to a misappropriation of funds. Taanadi followed suit in 2020, and its top management was condemned for fraud and put into jail.

The difficulties experienced by the market leader and the subsequent crisis of confidence in the sector resulted in a drop in the microfinance services utilization rate (from 11% in 2009 to 6.5% in 2020) (internal resources, 2021). The situation is stabilizing, however: the deposit portfolio grew 15% in 2021 while the loan portfolio remained stable. The regulatory authority (ARSM) is very hopeful that ASUSU will be able to relaunch its credit activity by December 2022. The existing credit portfolio (around FCFA 16 billion) has been provisioned and negotiations with ASUSU's creditors are almost over (ARSM, July 2022). Moreover, the situation is also seen as an opportunity for new players, as four newly-created private companies have requested authorizations to operate from the CB-UMOA in the past few months. Two of them have obtained their authorizations in 2022. These are Islamic institutions with Nigerien equity. The other two are La Poste Niger, and an Ivorian microfinance institution willing to operate in Niger.

[14] SFDs « under Art. 44 » are institutions that are big enough to be supervised by the BCEAO.

(4) The lack of trust also affects microfinance institutions' access to refinancing sources and the development of the whole sector is hampered by refinancing issues.

However, confidence has yet to be restored among traditional national microfinance lenders: in 2021, the consolidated debt of the microfinance sector (national and international) totaled FCFA 14 bn o/w 61% ASUSU and Taanadi. As of July 2022, the Nigerien banks are all very reluctant to lend to SFDs, even with access to guarantees or other kind of incentives (meetings with banks, July 2022).

(5) The offer for Islamic credit remains very limited. Islamic credit for agriculture does not exist, even if financial institutions are adapting their approaches in the field to meet farmers' expectations.

The Banque Islamique du Niger, which is the only fully sharia-compliant bank in Niger, does not have any activity in agriculture at present and is not interested in developing a specific credit offer for agricultural equipment. Two Islamic microfinance institutions have received a right to operate from the CB-UMOA in 2022. One of them, Tadamoun, seems interested in agriculture credit.

In the field, and especially in the Agadez region, some financial institutions such as the BAGRI have developed specific approaches in order to overcome the religious constraint. By proposing in-kind credit and integrating the credit fees into the buying price of equipment/input, they manage to reach a larger part of the population.

4.2 Commercial agriculture finance supply in Niger

4.2.1 Enabling environment

(1) Financial regulation, supervision and policies are fairly favorable to the development of financial inclusion in general and agricultural credit in particular.

- Banks and financial institutions in Niger are regulated by national legislation, included in a general framework common to all WAEMU countries. This legislation is adapted to development of a sound microfinance offer. However, the interest rate cap puts significant pressure on the profitability of rural credit activities, especially considering the dispersion of Nigerien demand.
- The government recently adopted several texts to consolidate the regulatory framework, of which a leasing order (2017), a decree regarding warrantage (2017), and the introduction of Islamic finance provisions within the SFD regulation (2016).
- The Nigerien supervisory authorities have made significant efforts in recent years to clean up and restructure the microfinance sector. However, some SFDs still do not comply with the regulation. In some cases, their knowledge and understanding of the regulatory framework has to be improved.
- There is a clear political will to develop agricultural credit. The "3N" Initiative implemented a significant coordination effort between development programs with the creation of the FISAN (see 5.1). Under the technical supervision of the Minister, Chief of Staff to the President of the Republic, and the financial supervision of the Ministry of Finance, it is the main stakeholder in the

implementation of the SNFI (national inclusive finance strategy) for all the topics related to agriculture finance[15].

(2) Recent regulatory changes regarding farming seem to have a positive impact on access to finance from the agricultural sector.

The adoption of the OHADA Uniform Act relating to cooperative companies law by the member states of OHADA (Organization for the Harmonization of Business Law in Africa) in 2010 led to a professionalization of producer organizations under the supervision of the DAC/POR. The majority of "paper organizations" disappeared, but the remaining ones strengthened their administrative staff.

In addition, land security has improved thanks to eased delivery of customary tenure acts and/or land titles by the rural code structures.

According to some financial institutions surveyed, these institutional changes have improved access to formal credit for cooperatives and farmers' organizations.

(3) Tax exemptions are granted by the State on several irrigation materials.

To promote irrigation at national scale, the Nigerien State granted tax exemptions on irrigation materials. However, according to a few stakeholders and especially equipment providers, the exemption system lacks consistency.

4.2.2 Microfinance

Preamble: Only a sample of microfinance institutions has been met within the frame of the survey. Detailed information regarding these institutions is presented in Appendix 2.

(1) Microfinance institutions are the traditional players financing smallholder farmers.

Microfinance institutions are the traditional providers of finance for rural populations and smallholder farmers. The majority of them, especially the cooperatives, have been created from rural development projects. They have adopted a local approach with points of sale outside of the main cities. Their organization and cost structure, as well as their flexibility on guarantees, allow them to disburse small credits, adapted to the needs of individual smallholder farmers or of small farmer groups. There is a lack of data available on the proportion of microcredit dedicated to agriculture in Niger though. For example, in 2020, statistics showed only 6% of the outstanding credit of MFIs addressed the primary sector compared to 76% for the tertiary sector (ARSM, 2020). However, many microfinance institutions do not identify their credit to agriculture as such. This number is thus considered as largely underestimated by sector professionals (ARSM, FISAN, FACEC, July 2022).

[15] Source: Stratégie Nationale de Finance Inclusive 2019-2023

(2) The microfinance loan offer is characterized by short maturities and interest rates of between 1.3% and 2% per month, on unpaid balances, with a 2-3% commission. Eligibility criteria are flexible, especially for informal farmers' groups and guarantees are flexible. The typical credit size is adapted to the needs of smallholder farmers.

The Nigerien microfinance loan offer is similar to that in other WAEMU countries:

- Short-term loans (from a few months to 2-3 years, a large majority being working capital loans).
- Interest rates between 1.3% and 2% per month on unpaid balances, with a 2-3% upfront commission: interest rates are capped in WAEMU. Specific attention should be paid to overall effective rates, especially considering the short duration of loans granted by some of the MFIs.
- Eligibility criteria, as well as guarantee policies, are generally flexible. For example, MFIs can accept unformalized guarantees or can easily rely on informal group guarantees, which appears to be a good solution to finance smallholder farmers in Niger.
- Microfinance institutions are used to dealing with large numbers of small credits, which matches well with the limited amounts needed at smallholder level to acquire irrigation systems.

(3) The Nigerien microfinance sector is fairly dispersed, especially for institutions active in rural and agricultural areas, with two of the biggest players under interim administration.

The 10 biggest institutions in Niger are presented below:

	ASUSU	Taanadi	Capital Finance	ACEP	MECREF	YTM	Proxi-fina	ARK	Finair	UCMN
Year of creation	2008	2010	2005	2013	1996	2001	2016	2002	2007	2006
Loan portfolio (FCFA m)[16]	9 761	4 358	1 492	4 563	934	1 104	418	861	549	245
% agric portfolio[17]	0.68%	N/A	8%	2%	N/A	63%	17%	N/A	2%	7%
Number of branches / PoS	N/A	N/A	9	5	N/A	11	6	N/A	N/A	10

[16] Source: ARSM, 31 December 2021

[17] Sources: interviews, other internal sources, Due Diligence SFD PIMELAN

Number of branches / PoS outside Niamey	N/A	N/A	6	2	N/A	11	2	N/A	N/A	7
Prior information on financial situation[18]	Bad	Bad	Average	Good	Unfavo-rable	Good	Good	N/A	Average	Unfavo-rable

(4) Urban microfinance institutions are interested in developing their agricultural credit activities. However, they still lack presence in rural areas, be it physical or through digital channels.

"Urban" microfinance institutions such as ACEP, Proxifina or Capital Finance have limited networks and remain concentrated in regional capitals.

Digital Financial Services targeting vulnerable populations are still fairly limited in Niger. ACEP, Proxifina and Capital Finance propose interesting initiatives. However, none of these institutions have "ready to go" strategies to rely on DFS to reach smallholder farmers. For these institutions, finding adapted channels to reach rural populations would be a prerequisite to really scaling up commercial irrigation finance.

(5) Niger has several local microfinance cooperatives, based in secondary cities. Only a few of them have reached a significant size and structuring level.

Several cooperative microfinance institutions, often created from rural development projects and with head offices in secondary cities, have been identified as relevant proximity lenders for smallholder farmers:

- ARK (Doutchi)
- Hinfani (Dosso)
- Gomin-Ka (Dosso)
- Yarda Zinder (Zinder)
- Yarda Tarka Maggia (Madaoua)
- Fin'Aïr (Arlit)
- Caisse Mutuelle du Niger (Arlit)
- MECAT (Maradi)

[18] Internal sources, Due Diligence SFD PIMELAN, Ayani NIP Study

These institutions typically propose group or individual credit to farmers with at least one year's experience. Access to credit is flexible: 10-15% of the credit amount is requested as a financial pledge, as is a certificate of customary tenure. The instruction period is generally limited to a few days and repayment calendars are adapted to crop calendars. Interest rates range from 1.5% to 1.7% on unpaid balances with a 2% commission. The credit duration is typically very short (a few months). These institutions perform close field follow-ups and the cooperative status is another motivation for the farmer to repay.

The institutional, management and financial capacities of these institutions are uneven. They often face governance issues. Moreover, few of them have achieved a significant size (see table above).

(6) Structuring is ongoing with the creation of a new umbrella network, FACEC. However, this momentum needs to be strengthened.

The limited size of microfinance institutions in Niger has resulted in several constraints:

- Many institutions lack the volume effect to support necessary investments and costs at head office level (MIS, internal audit and risk capacity, etc.).
- Many institutions are too small and/or too local to compete for international refinancing sources.
- Most institutions propose a limited outreach to donors and development projects.

Six small but promising microfinance institutions have been encouraged to band together in order to overcome these constraints. This has resulted in the Faitière des Coopératives d'Epargne et de Crédit (FACEC), a newly-formed cooperative umbrella (2019) that integrates six non-dissolved CPECs as well as three cooperatives that are well established in rural areas: Yarda Zinder, Yarda Tarka Maggia (Madaoua) and the Caisse Hinfani from Dosso.

A few key numbers are presented below:

2021	Yarda Tarka Maggia	Yarda Zinder	Hinfani	Gomni	Miyetti Allah	Gomni Ka	Karhe	Ambuta	Askia Dolbel	Total
Region	Tahoua	Zinder	Dosso	Dosso	Dosso	Tillab.	Dosso	Dosso	Tillab.	
Members	17 514	7 051	2 598	7 150	7 109	6 201	5 015	3 450	3 510	**59 598**
Outstanding credit portfolio	1,271 m	102 m	229 m	421 m	902 m	133 m	268 m	77 m	16 m	**3,418 m**
% credit in agriculture	70%	34%	40%	19%	8%	29%	36%	20%	22%	**39%**

AFD has supported the institutionalization of the umbrella body through the PAIF, and this is ongoing. FACEC proposes internal control to its members (support in the preparation of financial statements and pre-audits). It has also acquired a Management Information System (with the support of the PAIF). All the members are supposed to migrate to this system, and this migration is ongoing.

The members have very different sizes, which constitutes an integration challenge. However, most of them, and especially the big ones, are active in rural and agricultural areas.

FACEC has limited human and financial capacities at present. Its business model still needs to be validated. Although the creation of such an umbrella is very relevant, FACEC is unfortunately still far from being able to raise funds for its members based on a consolidated balance sheet.

(7) Microfinance institutions need funding to be able to develop their agricultural activities.

As stated in chapter 4.1, Nigerien banks are still very reluctant to lend to microfinance. Even when they do so, lending conditions are major constraints for SFDs (upfront deposit of 20%, real estate guarantee required, short term credit – max 2 years, high interest rates – 9% to 12.5%).

Moreover, with two of the four biggest institutions under interim administration, international lenders find it hard to identify SFDs of a significant size and compliant with their standards in terms of financial equilibrium, governance, and operational capacities.

This refinancing issue is the major constraint for the development of agricultural credit at MFI level.

Public refinancing initiatives are being discussed at both FISAN and SNFI level. Both of these bodies plan to create a refinancing fund dedicated to the microfinance sector and they are currently discussing with international donors, albeit with very little coordination between the two initiatives apparently.

(8) Microfinance institutions also have Technical Assistance (TA) needs for various aspects, both at the institutional level and to develop agricultural activities.

TA needs have to be further identified through individual diagnostics as each situation is different. Specific needs for selected institutions are detailed in Appendix 2. Microfinance institutions would both need specific capacity building to adapt their credit offer and better manage their credit risk to agriculture, and general institutional capacity building (strategy, MIS, risk management, etc.).

NB: Rural and agricultural development projects cover some of these needs (see 4.3.1 and 4.3.2).

(9) The Nigerien microfinance sector will benefit in the coming years from the support of a EUR 15 m program from the Luxembourg government. Some of this support targets directly the financial offer to agriculture.

In March 2022, the Luxembourg and Nigerien governments signed an indicative cooperation program (PIC, or *Programme Indicatif de Cooperation*) for 2022-2026 including a EUR 15 m package dedicated to inclusive finance. It will be implemented by the NGO ADA[19].

ADA's intervention will concentrate on three pillars:

- Support for restructuring and strengthening the microfinance sector,
- Support for the creation of a national refinancing facility for MFIs,

[19] https://www.ada-microfinance.org/blog-actualites-ada/ada-contribue-developper-lacces-aux-services-financiers-au-niger. For more information, please contact Mr. Souleymane Djobo – s.djobo@ada-microfinance.lu

- Support for the development of specific financial products adapted to the needs of agricultural value chain players, and young people and women entrepreneurship, as well as support for the development of credit for housing and access to water.

4.2.3 Commercial banks and the BAGRI

Preamble: Only a sample of banks has been met within the frame of the survey. Detailed information regarding these institutions is presented in Appendix 2.

(1) At first glance, banks have advantages to unlock agricultural credit.

Commercial banks could be interesting intermediaries to finance agriculture, especially given the weakness of Nigerien microfinance. They have interesting characteristics compared to microfinance institutions:

- Stronger financial structures
- Lower interest rates (9-12% per year) and longer maturities.

The eligibility criteria are stricter than the MFIs' criteria, but not that restrictive on paper. They are fairly similar from one bank to another, namely:

- Have an active current or saving account in the bank;
- Present a business plan (most farmers seek support from the CRAs or specialized private companies to draw up such plans, with the financial support of development projects);
- Present a land title – for smaller amounts, some banks (for example: BAGRI, Banque Atlantique) accept customary tenure acts;
- Provide a financial personal contribution (up to 10% of the total financing amount)

(2) Some commercial banks have been identified as active in the agricultural sector. They typically lend to a very limited number of cooperatives, big commercial farmers (> 10ha) or salaried workers / pensioners willing to start an agricultural activity.

With 17% of its portfolio engaged in the agriculture sector, BAGRI is the only bank having a significant activity in agricultural credit. In 2021, the BAGRI granted 1 152 agricultural credits, for a total amount of FCFA 5,916 m. The average size of credit disbursed is FCFA 5.13 m, which is small for a development bank. The breakdown of credits per type of beneficiary is the following:

2021	Amount disbursed	Number of credits
Campain credit breeders	203 677 000	5
Campaign credit cooperatives and farmers' organizations	45 200 000	4
Campaign credit breeding enterprise	600 000 000	3
Campaign credit agric enterprise	430 000 000	3
Short term credit cooperatives and farmers' organizations	436 230 762	106
Short term credit breeding enterprise	380 633 264	8
Short term credit individual farmer	333 821 355	457
Short term credit agric enterprise	67 782 860	6
Mid term credit agric enterprise	2 596 088 983	15
Mid term credit individual farmer	631 396 804	543
Mid term credit cooperatives and farmers' organizations	191 500 000	2
Total	**5 916 331 028**	**1152**

Over the 1 152 credits disbursed, 791 have been disbursed within the frame of a matching grant mechanism (see 4.3), representing 10% only of the amount disbursed.

Among these credits, 303 are in overdue for a total amount of FCFA 167 m.

Apart from the BAGRI, Nigerien commercial banks are not very involved in agriculture: even if some of them have been identified in regions as active in this field, notably Banque Atlantique (Agadez), or Orabank (Maradi), their volume of intervention remains limited, and these banks typically target commercial and well-connected farmers, cooperatives or private aggregators, and salaried workers/pensioners.

(3) Banks are very unlikely to ever be able to directly reach the majority of Nigerien farmers, because of structural and regulatory constraints.

However, they face major constraints to address the smallholder market:

- Their business model[20] only allows them to disburse credit of a fairly significant size, even if they can make exceptions if the client is located near a branch. Branches are concentrated in urban areas.
- Moreover, banks are constrained by Basel II regulation regarding the guarantees they can take on a given credit. In order to develop agricultural portfolios, they clearly need access to a risk-sharing mechanism covering a large majority of the credit risk.
- Banking corporate culture is not a field culture. Banks do not have adequate resources to undertake a close follow-up of the loans. Most of the time, this aspect is delegated to partners or projects/programs with low level of success (see 4.4).

[20] Interest rate cap, salary grid…

Hence, even if they generally don't mention minimum credit amounts or geographical constraints, banks are very unlikely to disburse credits below FCFA 5,000,000 to farmers from rural areas (living more than one hour from a bank branch), which constitutes the major demand for small-scale irrigation.

(4) The only bank that has significant activities in the agricultural sector, BAGRI, underlines that its agricultural department is unprofitable.

BAGRI started to lend directly to smallholder farmers with the incentive of projects and programs. It emphasizes that such an activity is not profitable for the bank. This is explained by a catch 22 situation: BAGRI doesn't have the capacity to handle such a large number of small credits, scattered in rural areas (limited number of officers, used to move around in comfortable cars, limited number of branches…), nor the right cost structure (see (3)). As a result, the follow up made on these credits is not enough, resulting in a bad repayment rate, making the activity even less profitable.

It continues to do it because it has the mission to offer financing solutions to every Nigerien farmer, and in regions such as Dosso/Tillabéri, it cannot rely on MFIs to propose credit to smallholder farmers for the moment. However, this activity is sponsored by profitable urban activities. BAGRI considers that this unprofitable situation is a structural issue and cannot be solved.

Whereas BAGRI is a public development bank and has a mission to finance agriculture, other commercial banks are unlikely to develop such unprofitable activities.

(5) Banks would be able to reach smallholder farmers through lending to formal cooperatives. Most of them lack experience and competences in agricultural credit to be able to properly handle such activity.

Banks have a limited range of target clients, and show limited capacity in extending this range, even with the support of IFC or other projects/programs.

	Production				Mixed	Upstream		Downstream
	Smallholder farmers - subsistence	Smallholder farmers - commercial	Medium to large scale commercial farmers	Farmer groups	FOs / cooperatives	Equipment providers	Large scale public development projects	Offtakers / industrials
Commercial banks			(x)		(x)	x	(x)	x
Microfinance institutions	(x)	x	x	x	x			
Development banks			x	(x)	x	x	x	x
Technical and Financial Partners	x	x	x	x	x		x	

Even when concentrating on the biggest clients, most of the Nigerien banks still largely lack agriculture credit knowledge, methods and tools. BAGRI is the only Nigerien bank with significant experience and a track record in this field. A few other banks, notably Banque Atlantique, have started to develop internal agricultural credit capacities. However, from the consultant's perspective, their motivation to finance

small-scale production through lending to cooperatives, and especially investment into irrigation, is rather limited.

(6) Commercial banks primarily express a need for risk-sharing mechanisms, and secondly for operational support from projects (client identification and follow up). Lastly, they would need TA to strengthen their approach to agricultural credit.

The main needs expressed by commercial banks to develop irrigation credit are as follows:

- Risk-sharing mechanisms / other types of formal guarantees – NB: as most of the Nigerien banks already have access to the PMEA (see 4.3.4), the Consultant doubts this would really be a key to unlick irrigation finance, or these mechanisms should be more incentive than the existing one.
- Operational support to carry out the preselection of borrowers, to support potential borrowers in constituting credit demand, and to follow up on the loans and/or build capacity for their own teams to better address agricultural activities (a more sustainable option).

Only the BAGRI expresses a need for long term refinancing.

NB: Access to favorable risk sharing mechanisms could unlock agricultural credit to large scale farmers or cooperatives but wouldn't allow banks to finance smallholders directly.

4.3 Irrigation financing schemes

4.3.1 The SPIN

The SPIN defines rules for producers to get access to finance for irrigation equipment. The corresponding mechanisms are still not fully operational, and do not fully resolve the "unfair competition" of development projects

One of the main objectives of the SPIN was to prevent development projects from competing with each other and with the commercial sector. Its basic principle is to fix a common access-to-finance path for small-scale private irrigation projects, and to adopt a common breakdown for the corresponding funding between grants, credit, and producers' contribution.

Applicants must submit their project to communal rural development commissions, either directly or through their producer organization. Public technical services, CRAs, or private consulting and service groups can help them prepare their projects. The latter must all follow a series of guidelines produced by the SPIN, including technical orientations regarding the irrigation systems to be implemented, financial evaluation rules, etc. Regional small-scale irrigation committees are in charge of the project selection process.

The "normal" breakdown of the funding is: 50% of the project must be funded by a credit, with a matching grant of 40% and a producer's contribution of 10%. There is no minimal amount for projects, but the overall budget must not exceed FCFA 15 m.

Nevertheless, there are many exceptions to this rule: “vulnerable” populations and “innovative” projects can apply for a 100% grant and territorial collectivities can be 65% subsidized. Given that over 40% of Nigerien population was living under the poverty line in 2018, and that dripping systems can be considered as “innovative”, a vast proportion of the population can apply for 100% funding in the framework of the SPIN.

The SPIN has yet to be implemented. Most of the institutional agreements were concluded during the first implementation period (2018-2021), but its effective deployment is set to start during the 2022-2025 period. As the SPIN itself does not provide funding (but rather a framework for donors willing to support irrigation), its effective implementation will strongly depend on the willingness of international partners to abide by its rules.

On the SPIN webpage, 7 projects are listed, with varying number of beneficiaries (PAARIS, PASEC, PROMOVARE, PRRACC, P2RS, ProDAF, PRECIS). Most of them started before the SPIN so they can't be considered as executing the SPIN.

4.3.2 The FISAN matching grant & associated projects

(1) The government created the Investment Fund for Food and Nutritional Security (FISAN) in 2017 with a view to channeling private funding to agricultural activities at country level. This aims to federate agricultural financing initiatives in order to increase the volume and quality of public and private agricultural financing offers and avoid the coexistence of parallel financing schemes.

The FISAN is defined as a set of financing mechanisms that enhance and/or complement existing financing mechanisms to facilitate investments in all segments of the food and agri-food value chains. It coordinates with various national strategies, among which the SPIN. It acts through three Facilities. The first Facility supports private investments through credit and other forms of financing such as guarantees, and has been implemented through a shared-cost financing mechanism, in order to co-finance the projects of value chain players. It works in partnership with local financial institutions (banks and MFIs).

The FISAN’s core principle is the matching grant, with a funding split as follows: 10% is funded by the value-chain actor, 40% is received in the form of a subsidy (granted by a development Project), and the remaining 50% is provided as a loan by the partner financial institution. Each financial institution (bank or MFI) proposes loans with terms corresponding to its own credit policy.

Typically, the farmer will be involved in some kind of capacity building/training within the frame of a development Project. He/she will become eligible to the matching grant. Then, the Project will support him/her in applying for a loan in a MFI/bank previously selected as a Project’s partner.

This split matches with the SPIN. It leaves space for exceptions to this repartition if the scheme targets vulnerable populations.

The FISAN raises funds from the State or from technical and financial partners. It manages these funds directly. Several technical and financial partners also comply with the FISAN principles even if they do not necessarily entrust the FISAN with their funds.

At present, the FISAN manages directly matching funds from the PRADEL, a project financed by the Belgium cooperation body and supporting the breeding value chain. The PRADEL is coming to an end, and a new project called the REEL, which will support breeding again, is in preparation. The amount dedicated to matching grants will increase from around FCFA 600 m to FCFA 2.033 bn.

Key figures regarding the PRADEL intervention are presented in Appendix 5.

The FISAN is also preparing regional projects financed by the Nigerien State and based on matching grant mechanisms, as follows:

Region	Amount of grant from the State (FCFA)	Targeted value chains	Partner bank
Tahoua	125 M	All	BOA (leasing)
Agadez	75 M	All	BOA (leasing/Islamic funding)
Maradi	125 M	Niebe, sesame, suche	Banque Atlantique
Zinder	125 M	Lowland rice (private facilities)	Orabank
Diffa	75 M	Pepper (production and transformation)	BSIC
Tillaberi	75 M	Transformation (women and youth)	BAGRI

(2) Beside the funds directly managed by the FISAN, several projects fall within FISAN's financing scheme. Some of them contribute directly to financing irrigation.

Several projects or programs working or having worked within the framework of the FISAN scheme have been identified. We present a non-exhaustive selection of them below.

Project / partner	Funder	Regions	Targeted value chains	Targeting irrigation	Partner FIs	Timeframe	Follow up projects
PPR	AFD (UE)	Tahoua, Agadez	n/a	YES (100%)	BAGRI, Yarda Tarka Maggia, Fin'Air, Capital Finance, Caisse Mutuelle d'Arlit	2017 - 2022	Forecasted, in partnership with the World Bank
PRADEL	Enabel	Dosso, Zinder, Tahoua	Breeding	NO	Yarda Tarka Maggia, Capital Finance, ARK, Hinfani Dosso	2017 - 2022	Validated, amount of matching grant x3, breeding VC
PAPI	Swiss Cooperation	Dosso, Maradi, Tahoua	Irrigated gardening	YES (100%)	ASUSU, BAGRI	2015 - 2027	n/a
PADAD	LuxDev	Dosso	Gardening, rice, groundnut, cowpea	YES (majority)	BAGRI, Hinfani Dosso (since 2020), Gomni-Ka (since 2020)	2016 - 2021	Extension to Zinder and Niamey

These projects/programs typically target smallholder farmers, farmers' organizations and mid-sized farmers with a focus on women and young people.

By way of an example, the PADAB (NIG25), financed by Luxdev, proposed matching grants following a 40% grant – 7% personal contribution and 50% credit scheme to 5,312 credits, reaching 6,680 farmers, of which 51% are women. 79% of the credits were disbursed to young farmers (men and women) and 21% to adults, with no indication regarding the sizes of the farms. However, the maximum financial value of the projects (FCFA 3.75 m), as well as the average credit amount (around FCFA 500.000 for rice farmers for example) prove that the project targeted and effectively managed to reach smallholders. 98.2% of these credits have been disbursed by the BAGRI and 1.8% by the two partner MFIs[21]. Repayment was a major issue for the BAGRI with a repayment rate of only 64% for NIG25 credits as of May 2021.

Yarda Tarka Maggia's experience with the matching grant, within the frame of the PPR, is very different: according to the CEO of the institution, repayment is not an issue, however, the institution faces difficulties to disburse the credits because of refinancing issues.

(3) The projects/programs all propose support to complement the loan, both to farmers and to financial institutions.

These projects and programs propose support for partner financial institutions and farmers, in order to unblock access to credit:

- Farmers:
  - Technical and management support, carried out by the CRAs / RECA
  - Support from private companies to develop business plans
- Financial institutions:
  - Technical assistance: this technical assistance covers both capacity building for agricultural credit activities and institutional capacity building. This technical assistance seems to have positive impact on the partner financial institutions. However, development partners underline the lack of absorption capacities of small-scale microfinance institution, which constitute the privileged partners for these projects, considering the failure of the traditional major players and the strategic retreat of the BAGRI from this type of customers. Besides, parallel actions of several projects can lead to a lack of coordination at institution's level.
  - Contribution to investments (motorbikes, MIS, etc.)
  - Subsidized operation costs: Capital Finance and the BAGRI for example benefitted from subsidies to cover operation costs of activities in rural areas implemented within the frame of development Projects. This approach doesn't appear as the most sustainable / scalable one as it means that these financial institutions' interventions in such zones are structurally unprofitable. It could only be justified if a strong business plan showed a break even for the activity after 2-3 years of portfolio development in these zones.

[21] Source : "Fiche d'expérience" Programme d'appui au développement agricole durable dans la région de Dosso – NIG/025, Feb. 2022

(4) The matching grant system has been a relative success, with a certain number of lessons learnt.

In Niger, and according to the various stakeholders, the matching grant has proven to be a suitable system, alleviating the investment cost, empowering the end beneficiaries, and creating a sustainable relationship between them and the partner financial institutions. The support provided by the CRAs / RECA in the field is well appreciated and appears to be a significant element of comfort for financial institutions.

Five major difficulties have been underlined:

- The preselection process realized by the development projects (PAPI, PADAB, …), involving business development service providers to "build business cases" and local and national project committees can be very cumbersome, for limited value added in terms of credit risk analysis at the financial institution level. Moreover, it creates bottlenecks at financial institution level as credit requests are shared in batches to financial institutions that sometimes lack the capacity to process all the requests in a limited time. This could be a major issue given the constraints imposed by crop calendars.
- Some institutions have experienced repayment issues. Experience shows that the financial institution has to be closely involved in both the selection of the cases, and in the follow up of the credits. It should be the one visiting the client to understand his/her financial needs, while checking on the reception of the equipment, the good use of the funds, and carrying out regular visits and calls to the client to recall the repayment schedule, both for performing and non-performing loans.
- The willingness and the capacity of the FI to disburse and closely follow up the loans has to be assessed properly. Every project should ask the partner financial institutions or support them by proposing a business case showing the sustainability of the forecast agricultural credit activity. This is especially true for projects targeting individual smallholders. In this context, pressure from projects on FIs to decrease their interest rate is often counterproductive.
- The quality of the equipment acquired on credit is key for good repayment of the loan. As many projects do not want the financial institution to impose a list of equipment providers on farmers, financial institutions sometimes struggle with this quality issue. Moreover, some dishonest practices have been identified where the equipment provider makes a deal with the farmer and provides low-cost and low-quality equipment instead of the equipment the farmer got financing for, which almost always leads to repayment issues.
- There's still a lack of coordination between the various projects (eligibility of working capital needs, % of grant, targeted value chains, etc.).

4.3.3 The PIMELAN

(1) The PIMELAN is a major project financed by the World Bank via a USD 134.9 m loan to the government of Niger. It targets six regions and various value chains. Part of the funds are dedicated to the financing of projects from end-beneficiaries. It is a six-year project (2019-2025).

The PIMELAN is a project funded by the World Bank and signed with the government of Niger in January 2020. It targets the following value chains:

- Onion, niebe, potato, pepper, rice, sesame, tomato, and moringa;
- Dairy, meat, cattle, hides and skins, eggs, and fish.

It covers all the regions except for Maradi and Agadez, and the entire value chain, from production to commercialization.

Its second component targets the private sector through three complementary sub-components:

- Support for VSMEs: financial literacy, access to the market, technical capacity building.
- Access to finance: PIMELAN has launched a call for proposals in its regions of intervention. There are two different windows:
  - The first window targets the smallest players in the Diffa, Tahoua and Tillabéri regions, with financing needs of between USD 500 and USD 3,000. A 10-20% personal contribution is requested, and the program covers the rest of the project with a grant. Investment and working capital needs are both eligible.
  - The second window targets the biggest players in all the regions of intervention. It proposes mixed financing (grants and credit) in line with the FISAN scheme: a 10% personal contribution, a 40-50% grant and 40-50% credit. The total grant amount is between USD 4,000 and 100,000.

  The total amount of the subsidy dedicated to the direct financing of end beneficiaries' projects is around FCFA 17 b (eq. USD 25 m).

  Consultants have been recruited to draw up business plans for the end-beneficiaries (VSMEs). Requests for funds are deposited in the program's regional branches, and then reviewed and approved by the project, which checks eligibility for the grant, then, for the second window, transmitted to partner financial institutions. The latter carry out their own appraisals and approve or refuse the credit. PIMELAN then takes in charge of following up the credit.
- Support for financial institutions: technical assistance and training to develop agricultural credit activities but also at institutional level (for example, YTM is currently in discussion with PIMELAN over support for the acquisition of a new MIS). The total budget for this component is USD 11 m (eq. FCFA 7.14 b), to be shared between the partner financial institutions. Since the beginning of the project, only FCFA 5 m has been disbursed for this component. Despite a very slow start of this component, and considering the budget size, it seems that PIMELAN's partner FIs will receive significant support over the next few years that should result in increased capacities to finance agriculture. However, this support is not likely to alleviate structural challenges preventing banks from direct lending to smallholders.

(2) The PIMELAN has selected its financing partners and just closed a first call for proposals. The second-window credit requests validated by the program represent 136 projects totaling FCFA 5.2 bn.

The following financial partners have been selected by the PIMELAN: four banks (BSIC, BOA, BAGRI, and Banque Atlantique), and two SFD (Yarda Tarka Maggia, and ACEP Niger).

All in all, 7,203 requests were deposited within the framework of the first call for proposals, of which 5,908 for the first window and 1,295 for the second window. 665 requests for both windows have finally been approved for a total of FCFA 6.0 bn (see table below).

	Number of requests	Number of projects retained for BP elaboration	Total cost of BP in F CFA	Number of projects financed	Total cost in FCFA
Window 1	5 908	997	1 369 123 254	529	847 238 529
Window 2	1 295	357	12 335 056 349	136	5 199 593 179

Depending on what the project owner's wishes to do, the projects deposited in the second window are transmitted to one of the partner financial institutions. The average second-window project cost is FCFA 38.2 m.

As of 8 July 2022, 45 projects had been transmitted to the four banks. No credit had been disbursed.

4.3.4 The guarantee schemes

The Nigerien financial sector can rely on a private guarantee fund, SAHFI.

SAHFI was created in 2005. The shareholding structure of SAHFI consists of five banks (Sonibank, BIA Niger, BOA, BAGRI, and Banque Atlantique) and three institutions (FSA, Tanio association, and SOPARFI). The guarantee fund can contract with other financial institutions (banks or MFIs). It currently has agreements with UCMN, YTM, Capital Finance, Proxifina, and Fin'Aïr.

SAHFI manages three guarantee funds and is negotiating two more. Its traditional activity is SME credit guarantees. The second fund is a fund dedicated to start-ups, with a specific focus on women and young people. The third one targets SMEs from agricultural value chains: the PMEA. It issues individual guarantees ranging from EUR 10,000 to EUR 100 m.

Today, the PMEA guarantees 27 credits for a total amount of FCFA 1.046 Bn. It has been mobilized by BSIC, Banque Atlantique, BOA and BAGRI. Considering its amount range, this fund clearly targets large-scale projects and agribusiness companies.

The two guarantee funds under negotiation are the following:

- An agricultural fund from the FISAN targeting smallholder farmers (loans from FCFA 100,000), working alongside with the matching grant system, and covering up to 60% of the losses, for a total amount of FCFA 1.112 m.

- A fund from the PIMELAN project, dedicated to guaranteeing the credits issued by PIMELAN's partner FIs, and covering up to 70% of the losses, for a total amount of FCFA 1.5 bn.

Each of the funds has specific eligibility criteria and characteristics. They should be able to cover the guarantee need of FISAN and PIMELAN's beneficiaries. However, they cannot be mobilized outside of their respective frames.

NB: As negotiations between SAHFI and PIMELAN are ongoing, the program has asked its partner banks to mobilize the PMEA instead for the first round of credits. However, the minimum amount of the guarantee is a problem for partner banks, which receive smaller-size credit requests. Besides, the PIMELAN was supposed to cover the guarantee cost, which is not the case with the PMEA.

4.3.5 Other financing schemes

The NIP

(1) The NIP (2016-2020) funded by IFC highlighted the potential for development of access to irrigation equipment on a commercial basis, a situation that implies involving the private and financial sectors.

The Niger Irrigation Program (2016-2020) was a partnership between the International Finance Corporation (IFC), Climate Investment Funds (CIF), and Netafim, a global leader in micro-irrigation technology. The project was supported by the Climate Investment Funds' Pilot Program for Climate Resilience (PPCR).

The NIP's objective was to address the market barriers to developing a large, irrigated agricultural sector in Niger by promoting private sector investment and capacity building in irrigation in the country. It promoted a new business model that provided small-scale drip irrigation technology to farmers through private sector and concessional financing. Netafim tried to conclude partnerships with financial institutions in order to propose irrigation-equipment purchase solutions to smallholder farmers, but these talks fell through. The main reason for this appears to be that the NIP didn't propose any matching grants associated with the credit, or risk sharing mechanism, or refinancing lines, to the financial institution.

In order to fulfill the project's objectives, Netafim offered to finance kits on credit using its own funds. However, it was never willing to develop this internal financing scheme. Nirritech, which has taken the lead on repayment of the equipment, admits that it "does not place particular emphasis on repayment". We can reasonably assume that these loans have been more or less treated as grants.

The credit seemed to be adapted to the needs of the smallholders.

The adaptation of drip irrigation technology for smallholders can be discussed (see 2.4.2 (1)). More generally, given that the needs and expectations of farmers could be different, support for one specific system at the expense of all the others appears to hinder the scalability of such a scheme.

The NESAP

(2) The NESAP is a program promoting solar equipment. It proposes a financing scheme in partnership with local FIs. The scheme's outreach remains limited.

The Niger Solar Electricity Access Program (2017-2024) is a World Bank funded program, whose objective is to promote solar energy in rural and peri-urban areas in Niger. Among others, it promotes solar pumps for irrigation. It proposes refinancing lines to MFIs and banks that are directed at financing solar equipment. Two banks (BSIC and Sonibank) and one financial institution (Capital Finance) benefited from the refinancing lines. Demand for the solar pumps promoted by the Program appears limited and the lines are currently underused. A partner complained that the conditions of the line were not very favorable compared to commercial refinancing from local banks. Once again, the main barrier to scaling seems to be the lack of flexibility regarding the equipment promoted.

4.4 Summary and conclusions for a future IFC intervention

The Nigerien financial sector is underdeveloped. In particular, microfinance in Niger is facing difficulties with the two major players under interim administration. These difficulties result in major refinancing issues at sector level that have significant impact on the development of microfinance in the country. However, financial regulation, supervision and policies are favorable to the development of financial inclusion in general and agricultural credit in particular. The adoption of the OHADA Uniform Act had a positive impact on access to finance of farmers' organizations.

Microfinance institutions are the traditional players financing smallholder farmers. Only they can propose a proximity offer to this customer base. The microfinance loan offer is characterized by short maturities and interest rates of between 1.3% and 2% per month, on unpaid balances, with a 2-3% commission. Eligibility criteria are flexible, especially for informal farmers' groups and guarantees are flexible. The typical credit size is adapted to the needs of smallholder farmers. The Nigerien microfinance sector is made of small-scale players. Especially, the institutions active in the field of agriculture credit are microfinance cooperatives ("SACCOs"). Most of them lack critical size and institutional capacities, to the exception of Yarda Tarka Maggia. These institutions are gathered under a recent umbrella network, FACEC. However, FACEC is still very new. To develop credit to agriculture, the microfinance sector critically needs funding. It also has needs in terms of capacity building, however, several projects are likely to fulfill these needs in the next few years. Access to risk sharing mechanisms doesn't appear as a requirement.

Considering the bad shape of the Nigerien microfinance sector, at first glance, banks present advantages to unlock agricultural credit. Eligibility criteria are not very restrictive on paper. Some banks have few activities in the agricultural sector, but they are structurally unable to directly reach commercial smallholder farmers, as they are very unlikely to disburse credits below FCFA 5,000,000 to farmers from rural areas. For example, BAGRI underlines that its direct lending activity to smallholder farmers is unprofitable and that this could not be fixed. Hence, banks would only be able to reach smallholder farmers through lending to formal cooperatives. Most of them lack experience and competences in agricultural credit to be able to properly handle such activity. Besides, such activity can only be developed with a risk sharing mechanism.

Various irrigation financing schemes supporting agriculture credit in general and credit for irrigation in particular were identified. The SPIN defines rules for producers to get access to finance for irrigation equipment. It constitutes a general framework but do not benefit from any dedicated funding. The FISAN is a fund that aims to coordinate equipment subsidy in the agriculture sector. It proposes a “matching grant” principle, with a funding split as follows: 10% is funded by the value-chain actor, 40% is received in the form of a subsidy (granted by a development Project), and the remaining 50% is provided as a loan by the partner financial institution. Enabel and the State entrusted funds to the FISAN and various Development projects follow its matching grant principle. The success of its implementation largely depends on the partner financial institution. The development Projects also typically propose support to farmers and financial institutions.

The PIMELAN is a major World Bank program, which specificity is to apply the matching grant principle only to projects above USD 3,000. It also proposes technical assistance to its partner financial institutions. The PIMELAN’s activities are slowly starting, 2.5 years after the launch of the project.

The Nigerian financial sector can rely on a private guarantee fund, SAHFI, that notably manages an envelope dedicated to agriculture and agribusinesses, the PMEA. It issues individual guarantees from EUR 10,000. For now, it only guaranteed a few large-size credits. Two other guarantee funds dedicated to agriculture are under negotiation: the FISAN and the PIMELAN guarantee funds. Unlike the PMEA, the FISAN guarantee fund is likely to address the demand of smallholder farmers.

Other financing schemes have been identified such as the NIP and the NESAP. Both projects seem to have a limited outreach. One common explanation is the lack of flexibility regarding the equipment promoted.

Some major conclusions from this supply-side analysis will orientate the recommendations for a future IFC intervention:

1. Microfinance institutions are the only financial players in capacity to propose direct credit to smallholder farmers. However, very few of them reached sufficient size and financial capacity to be eligible to a IFC financing tool.

2. Banks can only reach smallholder farmers through a "last mile distribution partner" that could be a microfinance institution or a cooperative. Most of the banks still need capacity building to properly address this market, but the PIMELAN is going to bring significant budgets to this aim in the following years.

3. Experience from the matching grant scheme confirms the need to work through microfinance institutions to directly reach smallholders. As the volume of matching grants available at country level for agriculture increases, the financing capacities of MFIs will constitute a major bottleneck.

4. MFIs would also need technical assistance, however, most of them will receive some through the PIMELAN and/or other development Projects. Risk sharing mechanisms are not specifically required by the players and the FISAN guarantee is likely to cover potential demand for such mechanisms.

5. Previous schemes' experience underlined the need of flexibility: a commercial irrigation credit offer should adapt to the demand and hence not be restricted to a specific equipment.

5. Recommendations for a future IFC intervention

5.1 Summary of main conclusions from the analysis

The previous analysis has led to a certain number of conclusions reunited below:

Conclusions from the overview of irrigated agriculture in Niger:

- Scaling up commercial irrigation in Niger doesn't require targeting a specific region of Niger.
- The bulk of the potential market for irrigation equipment is made of commercial smallholders with access to labor and land but limited access to capital. Other groups of farmers with access to land and working capital could be included in the project, but their number would not be enough to reach the afore-mentioned critical mass. Besides, as these producers are confronted with fewer constraints, it will be easier to adapt marginally a project suited for smallholding famers with no access to capital to fit wealthiest actors.
- It is possible to identify serious and reliable farmers' organizations in Niger. However, these organizations not being involved into commercialization constitute a constraint for them to act as key players within a financing scheme.
- The most efficient and environmentally sustainable solution, the drip, is also the most expensive one. It doesn't seem to be very adapted to a large-scale diffusion to smallholder farmers, considering its fragility, complexity, and lack of flexibility.
- Irrigation equipment is a significant investment for a smallholder. Low-cost initiatives should be preferred over more sophisticated ones to ensure profitability of the investment and maximize repayment capacity of a credit at farmer's level.
- Small-scale irrigation is best suited for market gardening and tree crops. Producers investing into irrigation equipment need to constantly adapt their crop choices to the supply and demand fluctuations in order to maintain satisfying selling prices and be able to get return on investment

Conclusions from the demand-side analysis:

- Simpler systems such as Californian networks are preferred over more complex systems. Their availability is ensured all around Niger, with quality issues. Only working with a few Niamey-based irrigation equipment providers is likely to hinter the development of a large-scale irrigation value chain.
- Support from the RECA/CRAs would be key to guarantee the quality of irrigation equipment on the field. They could also orientate both farmers and financial institutions on identifying the most suitable equipment considering the characteristics of a specific farm or on the right crops to focus on at a specific moment.
- Development projects have had both positive and negative consequences on the needs and expectations of farmers for irrigation equipment credit. Partial grants allow farmers to repay such a

credit on a limited period. IFC will have to seek a good coordination with existing or future projects linked to small-scale irrigation.

- Though the commercial intermediary system doesn't seem to be a fair system to encourage, cooperatives could be channels to distribute credit to smallholder farmers. However, they are likely to lack capacity to handle mid to long term equipment credit.
- Smallholder farmers not only lack funds for investing into irrigation systems, but also lack the working capital to carry out their activity. This situation is mostly responsible for their dependency on commercial intermediaries. In this context, financing the equipment alone is not a viable option.
- As most smallholders are still very far from formal financial institutions, proximity financial providers such as MFIs and especially the "SACCOs" could better fit the demand. This is also an argument to consider financing options through farmers' cooperatives.

Conclusions from the supply-side analysis:

- Microfinance institutions are the only financial players in capacity to propose direct credit to smallholder farmers. However, very few of them reached sufficient size and financial capacity to be eligible to a IFC financing tool.
- Banks can only reach smallholder farmers through a "last mile distribution partner", that could be a microfinance institution or a cooperative. Most of the banks still need capacity building to properly address this market, but the PIMELAN is going to bring significant budgets to this aim in the following years.
- Experience from the matching grant scheme confirms the need to work through microfinance institutions to directly reach smallholders. As the volume of matching grants available at country level for agriculture increases, the financing capacities of MFIs will constitute a major bottleneck.
- MFIs would also need technical assistance, however, most of them will receive some through the PIMELAN and/or other development Projects. Risk sharing mechanisms are not specifically required by the players and the FISAN guarantee is likely to cover potential demand for such mechanisms.
- Previous schemes' experience underlined the need of flexibility: a commercial irrigation credit offer should adapt to the demand and hence not be restricted to a specific equipment.

5.2 General approach and financial tools to mobilize

Considering the previous conclusions, it would be recommended to IFC to invest into a microfinance institution, under the form of a long-term credit line, to increase direct investment credit to smallholder farmers, or into a bank that could reach smallholders through lending to farmers' organizations or to MFIs.

According to its intervention principles, IFC could support the scaling up of a commercial irrigation market and the development of a commercial financing offer for irrigation through investments in three types of stakeholders:

- Equipment providers,

- Offtakers,
- Financial institutions.

From the NIP's experience, the IFC team pre-identified that the best solution to scale up commercial irrigation would be to support the financial sector, because an important lending capacity is key to ensure access to irrigation at national level. The conclusions of the study confirm this approach:

- A support to a specific equipment provider would not be the best suited one as irrigation solutions are already available in the country, and as farmers have different expectations and should have the choice among different solutions. Besides, considering the limited size and capacities of the existing specialized providers, it would limit the outreach of IFC's support.
- Supporting an off taker would also limit the outreach of a financing scheme to a specific crop. Besides, in Niger, off takers remain scattered and largely informal and tend to develop predatory behaviors towards smallholders.

Two options could be considered:

- Support an MFI with an affordable, long term refinancing line to develop its credit to agriculture in general, with a specific focus on irrigation equipment. The challenge will be to identify a sound player, with a real potential to reach agricultural communities and a sufficient size to absorb IFC's typical volumes of intervention.
- Support a bank to increase its credit offer for irrigation equipment, with a priority on lending to cooperatives, and/or to strengthen its credit offer to MFIs. The main challenges will be
  - to identify the right partner, with a demonstrated motivation to reach farmers,
  - to precisely understand with which kind of financing tool IFC could have a catalytic action, especially considering the current offer on the Nigerien financial place in terms of guarantee and technical assistance.

In both cases, it would be required to enhance technical capacities around irrigation on the field through a support to the RECA. As stated above, the RECA and the CRA are well established, trusted partners to producer organizations and State institutions, who provide market intelligence and technical advice on a regular basis. As such, they could be useful allies for banks and IMF to help define quality criteria for irrigation projects to be funded. Various forms of collaboration could be envisioned, ranging from the realization/update of specific regional studies to identify best practices and best suited irrigation methods, to the elaboration and updating of databases of trusted suppliers and brands to ensure the quality of the irrigation materials and equipment to be used in projects, through the subsidization of capacity building for the supported financial institution's teams on irrigation topics.

5.3 Pre-selection of potential financial partners

Option 1: Microfinance

(1) 4 of the 10 biggest SFD were met within the frame of this assignment.

4 of these 10 SFD have been pre-identified as potential targets for an IFC investment based on the following criteria:

- Size and outreach
- Financial situation
- Previous activities in agriculture finance /interest for agricultural activities

NB: La Poste Niger also decided to launch a microfinance institution, Poste Finance, in order to be able to offer credit to underserved populations. The entry of this new player, which can rely from an extended network of 100 points of sale, could have a significant positive impact on financial inclusion in the country. However, in July 2022, Poste Finance was still waiting to get authorization to operate.

Detailed minutes of the meetings are presented in Appendix 2.

	Capital Finance	ACEP	Proxifina	Yarda Tarka Maggia
Experience in agriculture/irrigation finance	Limited	Limited	Limited	Extensive
Interest for agriculture / irrigation finance	Confirmed	Confirmed	Confirmed	Confirmed
Financial situation	NOK	NOK	TBC	TBC
Future access to TA related to agric credit	No	Yes (PIMELAN)	No	Yes (at least: PIMELAN, PPR)
Access to matching grants	Yes	Limited (only credits above USD 4 000 through PIMELAN)	No	Yes

Future access to guarantee for agric credit	FISAN?	PIMELAN	No?	PIMELAN - FISAN
Support expected from IFC to unlock irrigation finance	N/A	Refinancing TA	Affordable refinancing	Refinancing TA
Recommendation		+	(limited size)	++

The recommendation to IFC would be to assess the feasibility of proposing a credit line to Yarda Tarka Maggia.

Among the 4 institutions, Yarda Tarka Maggia appears to be the only one with significant experience in agricultural credit and significant footprint in rural areas. Though Yarda Tarka Maggia tends to be more and more solicited by development projects and has access to matching grants and technical support, it still lacks refinancing to develop its activities. Figures shared by the institutions as well as global perception of the institution from various stakeholders met during the study show a positive image of the MFI. In-depth due diligence would however be required to assess the investment opportunity.

An alternative could be ACEP. However, its financial situation appears quite unfavorable and its interest and motivation to finance agriculture need to be confirmed, especially through the opening of a branch in Koni.

Option 2: Banks

(2) 3 commercial banks and the BAGRI were met within the frame of this assignment.

From the 14 Nigerien commercial banks, 3 have been selected based on the following criteria:

- Partnerships with current agric. development projects or with the FISAN;
- Field identification of their involvement in agricultural credit.

NB: The following conclusions have been made from discussions with middle managers and do not engage the top management. To gather more detailed information, IFC should officially contact the banks' top management.

Detailed minutes of the meetings are presented in Appendix 2.

	BAGRI	Banque Atlantique	BSIC	BOA
Experience in agriculture / irrigation finance	Extensive	Limited	Limited	None
Interest for agriculture / irrigation finance	Confirmed	Confirmed	To be confirmed	To be confirmed
Interest to develop its lending activity to MFIs	Yes	No	No	No
Future access to TA related to agric credit	PIMELAN	PIMELAN	PIMELAN	PIMELAN
Access to matching grants	PIMELAN, PPR, LuxDev, …	PIMELAN	PIMELAN	PIMELAN
Future access to guarantee for agric credit	PIMELAN FISAN PMEA	PIMELAN FISAN PMEA	PIMELAN FISAN PMEA	PIMELAN FISAN PMEA
Support needed to unlock irrigation finance	Affordable, long term Refinancing TA	TA	Directed refinancing TA	N/A
Recommendation	++	+		

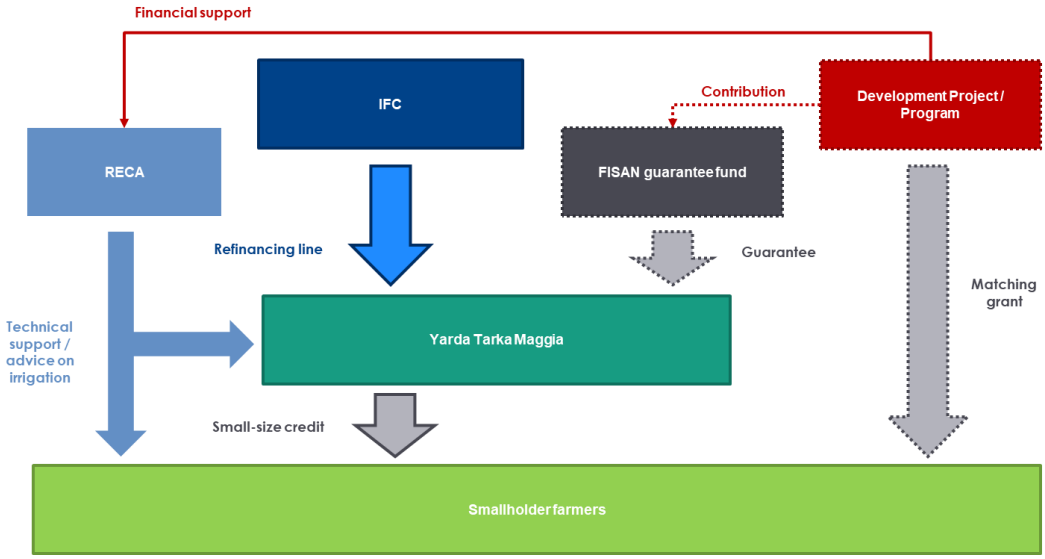
The recommendation to IFC would be to assess the feasibility of supporting BAGRI into its wholesale credit function through a credit line and technical assistance.

The motivation of BSIC, Banque Atlantique and BOA to scale up their agricultural activities is yet to be confirmed. They didn't show a clear strategy or action plan to develop these activities and, to the exception of Banque Atlantique, didn't invest much efforts into this development. They didn't manage to express very clear and consistent needs in terms of needed support, notably because they just started working with the PIMELAN project and stood in a "wait and see" position.

BAGRI, in the opposite, already experienced agricultural credit to a large extend. Based on its past experiences, it developed a clear vision and strategy to address the needs of smallholder farmers. This strategy is to be a “wholesale lender”, reaching smallholder farmers either through MFIs, or through cooperatives. An intervention from IFC under the form of a long term, affordable refinancing line could contribute to unlock irrigation finance in Niger. Technical assistance would also be needed to enhance its credit risk management capacity towards MFIs and cooperatives.

5.4 Proposed intervention schemes

Option 1: Direct refinancing of Yarda Tarka Maggia

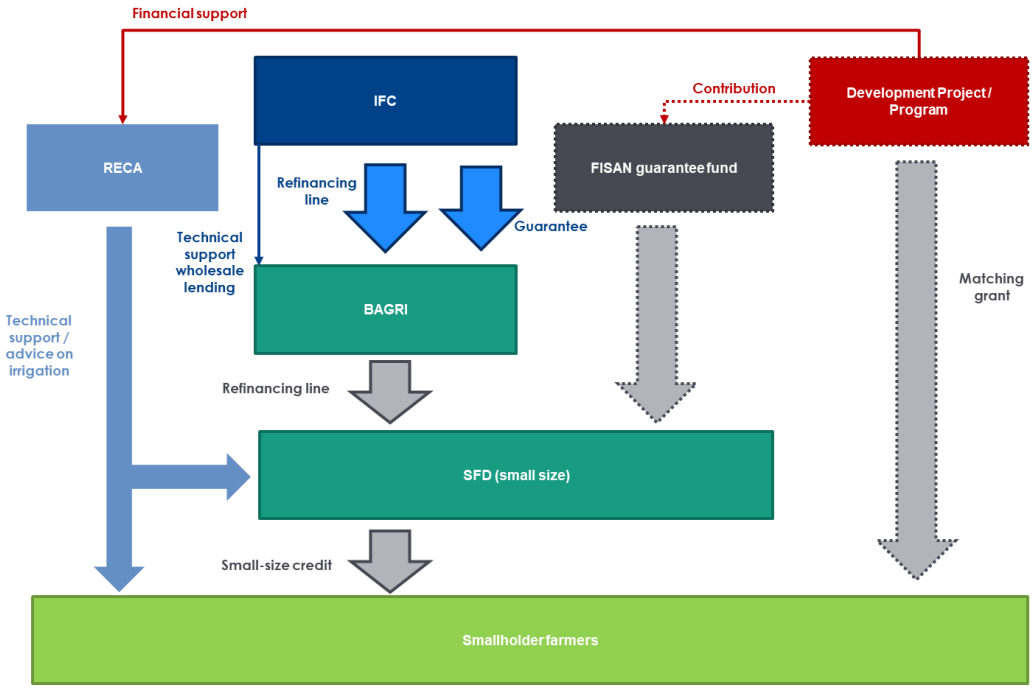


Option 1: Direct refinancing of SFD

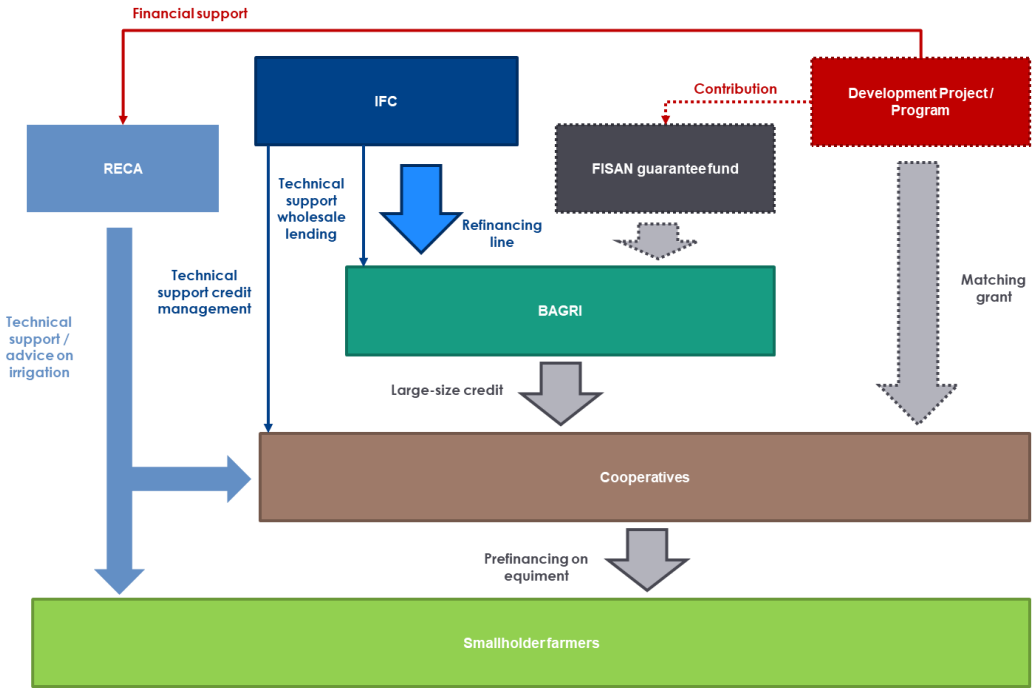
NB: In the chart, dotted elements are optional and outside of IFC's intervention.

- Affordable and mid-long term refinancing line, restricted to the financing of agriculture and irrigation:
  - Interest rate: below market rates (max 9%?)
  - Maturity: 5 to 7 years
  - No geographic focus: the MFI's geographical coverage should determine the areas where the disbursement of credit to smallholder farmers will be possible.
  - No constraint in terms of value chain/crop: in order to maximize the chances to meet the demand for irrigation at national scale, it would be recommended not to limit the use of the line to a specific value chain.
  - No exclusion of working capital loans: as stated in 4.4, microfinance institutions need refinancing in order to be able to meet farmers' credit needs, not only for investment but also for campaign prefinancing. Hence, limiting the use of the credit line to irrigation investment would be counter productive.
  - Can be mobilized together with matching grants or alone: the MFI will have the flexibility to use the line either for a standalone credit to any customer, or for a credit entering into a "matching grant" scheme.
  - Consider having only a part of the line directed to agriculture finance: Considering the size of the institution and its global need for refinancing, it could be interesting to also propose a non-targeted line with an objective of
- Financial support to the RECA/CRA network (see 5.2) – to be coordinated with the PIMELAN?

Option 2: Support to BAGRI in its agricultural wholesale lending product(s)



Option 2a: Support to BAGRI in its agricultural wholesale lending product to MFIs



Option 2b: Support to BAGRI in its agricultural wholesale lending product to cooperatives

NB: In the charts, dotted elements are optional and outside of IFC's intervention.

- Affordable and mid-long term refinancing line, to be lent to MFIs and cooperatives and directed to finance irrigation equipment for smallholder farmers.
  - Interest rate: below market rates (% tbc)
  - Maturity: 7 years
  - No geographic focus: the location of strong cooperatives and MFIs will determine the final geographical outreach of the intervention.
  - No constraint in terms of value chain/crop: in order to maximize the chances to meet the demand for irrigation at national scale, it would be recommended not to limit the use of the line to a specific value chain.
  - No exclusion of working capital loans: as stated in 4.4, microfinance institutions need refinancing in order to be able to meet farmers' credit needs, not only for investment but also for campaign prefinancing. This is also the case for cooperatives. Hence, limiting the use of the credit line to irrigation investment would be counter productive.
  - Can be mobilized together with matching grants or alone: the MFI (BAGRI's client) or the cooperative will have the flexibility to use the line either for a standalone credit to any customer/member, or for a credit entering into a "matching grant" scheme.
- Guarantee fund dedicated to mid to long-term credit lines to MFIs (optional - 2a only)
- Technical assistance:
  - Support to BAGRI in improving its partnership framework, product offer, as well as its credit risk management tools for wholesale lending.
  - Support to build credit fund management capacities at cooperative level: training and coaching of staff in charge, tools, methods, etc. Control mechanisms should also be introduced to avoid diversion or patronage effects (2b. only).
- Financial support to the RECA/CRA network (see 5.2) – to be coordinated with the PIMELAN?

Appendix 1: Example of prices for irrigation equipment from the African Agribusiness Center

Mechanical boreholes + submersible pumps

Borehole 30m + diesel group	FCFA 1,150,000
Borehole 30m + submersible solar pump (Grunfos/Lorenz)	FCFA 2,750,000

Pumps (designed by Chinese partners)

Diesel motor pump	FCFA 250,000
Gas motor pump	FCFA 180,000
Solar pump small size – 9 sq. m / hour	FCFA 550,000
Solar pump mid-size – 20 sq. m / hour	FCFA 850,000
Solar pump large size – 40 sq. m / hour	FCFA 1.2 m

Nb: the small size solar pump is the most suitable one for smallholder farmers and can be associated to any of the three irrigation systems presented below on 0.5 ha.

Irrigation systems

Californian (0.5 ha)	FCFA 250,000
Hadari (0.5 ha)	FCFA 750,000
Dripping (0.5 ha), spacing of 1m	FCFA 850,000

Combined solutions

Californian + solar pump	Starting at FCFA 1.6 m per ha
Hadari + solar pump	Starting at FCFA 1.8 m per ha
Dripping + solar pump	Starting at FCFA 2.6 m per ha for a spacing of 1 m Starting at FCFA 2.2 m per ha for a spacing of 8 m (suitable for tree crops) Up to FCFA 5 m per ha for denser spacing patterns.

Appendix 2: Detailed information collected on FIs

Microfinance institutions

Minutes from qualitative interviews

Capital Finance is interested in developing its agricultural credit activities. However, the institution shows no interest in a partnership with IFC.

Capital Finance is a "business cooperative" that is being transformed into a limited company. It is mainly owned by a Nigerien holding company operating in various sectors such as real estate and hotels. Originally, its clientele primarily consisted of civil servants. In 2018, the government decided to domiciliate the salaries from civil servants in Niger Post. Capital Finance managed to redirect its activities towards salaried workers from the private sector and urban microbusinesses. It has nine points of service, located in Niamey and regional capitals.

Agriculture is not a large part of Capital Finance's loan portfolio. All the activities are carried out under partnerships with projects. However, the SFD has just opened a branch in Agadez with the idea of developing agricultural credit. One of the difficulties faced by the institution is the fact that farmers are now very familiar with the concept of matching grants and have become reluctant to assume the totality of the investment on credit, making the availability of matching grants necessary. Another major constraint is operational costs: in the SFD's experience, direct loans to smallholders are not profitable. It used to target farmers' groups in priority, but this approach had its limitations as most of the groups find it difficult to register legally, due to ID issues in particular. Capital Finance does not have agents dedicated to agricultural credit because it cannot afford it. Moreover, aside from the framework of partnerships, Capital Finance only grants agricultural loans within its intervention areas (15 km around a branch). Capital Finance has not developed any value chain partnerships. It is reluctant to do so on the principle of orienting the client to one or another irrigation solution, as it does not want to be responsible for a technical failure.

Capital Finance does not face any refinancing issues. In order to develop an agricultural loan portfolio, it would need to get a subsidy to cover operational costs (fuel, salaries, etc.). However, Capital Finance did not show any interest in a partnership with IFC, because of bad experiences in the past.

Yarda Tarka Maggia seems to be a promising institution to develop irrigation finance in Niger. It currently faces refinancing issues.

Yarda Tarka Maggia is the biggest SFD in the FACEC network. It was created in 2001, from an EU project supporting irrigation: ASAPI. It is based in Madaoua. It has 11 points of service, interestingly not limited to regional capitals: eight of the points are in the Tahoua region and three in the Zinder region. YTM has an ambitious development plan for 2022-2026 with the objective of 20 points of service in four

regions (Maradi, Tahoua, Zinder, Diffa) and a desk in Agadez, especially to manage cash transfer contracts.

YTM has had a positive experience with rural development projects proposing matching grants (especially with AFD's PPR). It is also starting a partnership with PIMELAN and will receive institutional support from the program.

Yarda Tarka Maggia is in a development phase. It recently drafted a 2022-2026 business plan with the support of a project. However, this development is limited by the availability of refinancing sources. It is one of the rare SFDs still getting refinancing from banks. That said, it suffers from a tightening of financial conditions at national bank level, due to the national microfinance crisis, but also to shareholding changes in several Nigerien banks. YTM lacks physical collateral and banks are more and more reluctant to pledge its loan portfolio. Two banks still offer YTM refinancing, but the amounts are far too limited compared to the customers' demand. YTM would also need institutional support, to strengthen its MIS. However, it is already negotiating with PIMELAN on this aspect.

Proxifina is mainly an urban-oriented MFI with limited outreach in rural areas. It has limited size and experience in agriculture credit.

Proxifina is a recent microfinance institution created in 2016 with private funding (the majority Nigerien individuals), under the impetus of its current president, who has international experience in microfinance and an agronomist background. The SFD received its authorization in June 2020. Its vision is to offer financing solutions for agriculture, crafts, services and trade in order to contribute to economic development and poverty reduction. A new CEO arrived two months ago from Baobab Côte d'Ivoire. Proxifina has a limited number of branches still: six points of service in Niamey, one in Maradi, and one in the Tillabéri region.

Around 20% of its credit portfolio is dedicated to agricultural activities (ca. 50 loans). It mostly finances individual farmers. However, Proxifina's strategy is to develop its credit portfolio thanks to value chain partnerships. Last year, Proxifina started a value chain partnership for potato production: it has granted a big loan to a farmers' union grouping more than 30,000 smallholders from the Mokoukou area. Thanks to this loan, which is disbursed in cash, the union buys seeds and input and distributes this on credit to its members. The loan provided to the union was above FCFA 100 m. To date, the union has not expressed a need for irrigation equipment financing.

Proxifina only grants short-term credit. However, it has developed specific loans for agriculture with repayment schedules adapted to agricultural activities. The agriculture credit conditions are as follows:

- Minimum amount: FCFA 50,000
- Credit cost: 1.6% per month interest rate and a 2% commission
- Guarantee policy: group guarantee, personal guarantee, informal collateral (no formal mortgage required)

It does not have agents dedicated to agriculture. The staff is fairly small, with only one credit officer per branch, who also supervises the branch activities. Its area of intervention is not strictly defined. Loans can be granted to clients living up to two hours' drive from the branch. Proxifina has been selected to

be a financial partner for PROMEL (Swiss Cooperation) but has no ongoing partnership with development projects and thus no current access to matching grants.

Proxifina is currently in talks with IFC Dakar to benefit from a grant to cofinance their business plan. In the long run, Proxifina would need affordable refinancing to support its ambitious development plan.

Developing agrifinance activities is part of Proxifina's strategy. The SFD would be interested in benefitting from IFC's support to develop irrigation finance:

- TA (recruitment and training of dedicated agents and the setting up of a dedicated department, development of adapted tools such as sectorial cards)
- Refinancing, especially to have access to mid to long-term resources.

ACEP is the Nigerien leader in the VSE segment. It is highly motivated to develop agriculture credit and has access to matching grants through PIMELAN.

ACEP is the Nigerien leader in the VSE segment. It was created in 2012 and is part of an international network of four institutions. Its main shareholder is ACEP Group (ACEP International, IPAE, BIO). The MFI has a solid financial and governance profile. Its network of branches remains concentrated in urban centers.

ACEP recently started developing activities in rural and agricultural areas with the support of specific projects and programs. The agricultural loan portfolio remains very limited compared to the total portfolio (around 100-150 clients out of 3,600). This portfolio does not have any repayment issues at present. ACEP has been active in onion crops, dairy transformation, and moringa. In particular, it is in discussion with an onion "comptoir" (or trade centre) comprising 7,000 members but the MFI lacks resources to cover the financing needs for all of them. The role of the comptoir is to support risk identification at both activity and client level. The loan is granted directly to the member. Moreover, the wealthiest members give their personal guarantees to ease access to credit for the smallest members. They currently finance 100 members, mostly involved in commercialization (exporting to Ghana and Ivory Coast). Another major constraint is the distance, as the comptoir is located 115 km from the Tahoua branch. In order to better seize this partnership opportunity, ACEP is considering opening a branch in Koni, which is 15 km from the comptoir.

ACEP does not have any specific agriculture loan products and, for a long time, the MIS did not enable flexible repayment schedules. ACEP now has the capacity to propose grace periods, and quarterly repayment, etc. However, it still has a unique loan product integrating this flexibility, with a 1.25% monthly interest rate (degressive) and a 2% commission. It does not have staff dedicated to agricultural activities, but the new CEO from Haiti has considerable experience in agricultural credit and would be willing to develop this activity. According to the SFD, only two branches offer potential for loans to agriculture: the Tahoua and the Maradi branches. These two branches already finance farmers living up to 100 km from the branch offices.

ACEP has been selected as a financial partner for PIMELAN and is considering two other partnerships with CATALYZE (USAID) and a project financed by CICR/Fondation Grameen Crédit Agricole to propose credit to women-led farmer organizations in Agadez.

ACEP has already met IFC once and sent some documents to the Dakar office. Refinancing would be a priority in order to develop agricultural credit activities. Technical assistance to support the creation of an agricultural credit department would also be appreciated.

Key financial performance indicators of MFIs

CFA Franc	Proxifina		Capital Finance		ACEP		YTM
	2021	2 020	2021	2020	2021	2020	2021
Outstanding loan portfolio	351 599 942	346 271 557	1 486 061 303	1 293 507 605	4 458 325 886	4 045 019 747	1 350 783 001
Equity	76 281 865	17 865 307	1 102 241 438	1 325 953 564	110 269 581	709 070 650	821 401 576
Operating Income	398 023 656	146 682 838	877 672 932	795 221 350	1 357 039 342	1 179 460 830	351 438 441
Cost of risk	7,46%	4,56%	nd	nd	-1,0%	4,24%	16 567 681
Refinancing cost	12 705 931	863 545	4 792 143	8 444 846	498 521 645	457 110 115	19 122 040
Operating cost	324 692 190	270 003 688	978 858 096	685 763 076	1 256 026 414	919 946 219	301 489 341
Operating result	58 135 058	-124 377 995	- 101 185 164	109 458 274	-325 601 808	-368 986 009	70 271 558
Amount of refinancing	94 208 900	0	58 188 600	130 924 350	3 490 361 300	800 000 000	-
PAR 30	5,18%	2,40%	218 907 509	86 739 265	5,26%	8,59%	nd
PAR 90	2,70%	0,80%	182 036 376	81 153 285	4,61%	7,78%	1,77%
Liquidity ratio	87,35%	79,30%	103,15%	123,10%	30,48%	38,67%	nd
Solvency ratio	nd	nd	28,41%	32,73%	1,83%	10,36%	nd
Outistanding loan portfolio in agriculture	79 604 731	17 601 941	nd	nd	135 729 846	37 586 617	nd
Number of credits in agriculture	124	67	nd	nd	146	49	nd
PAR 30 agriculture	4,36%	3,14%	nd	nd	3,37%	1,39%	nd
PAR 90 agriculture	1,07%	2,94%	nd	nd	2,56%	0,96%	nd

Commercial banks

Banque Atlantique is highly motivated to develop agriculture credit, even if the activity is still nascent. However, its focus is on cooperatives or other SME value chain players rather than on individual farmers.

Banque Atlantique has 18 branches, 13 in Niamey and the others in Agadez, Zinder, Tahoua, Maradi and Dosso. Banque Atlantique recently developed an interest in financing agriculture, with the signature of a partnership with the PIMELAN project in 2020. Under the impetus of this project, it created an "Agri Desk". Two staff members are dedicated to agricultural credit but all the account managers have been trained on the topic.

BAN targets unions of cooperatives, cooperatives, and farmers' organizations. It is also targeting salaried workers (or professionals such as doctors and lawyers) willing to invest in irrigated farming, as well as big input and seed providers. In 2020, Banque Atlantique started to flag its credits to agriculture. They currently amount to FCFA 900 m. Banque Atlantique has drawn up an agricultural credit strategy, that has yet to be transmitted for approval at group level. The objective for end 2022 is to grant an additional FCFA 2 bn in credit. Banque Atlantique has no doubt it will manage to reach this objective as it is already in discussion with 3-4 big input suppliers importing from abroad. Banque Atlantique sees good potential in purchase order financing, within the framework of development projects.

Despite the constraining Basel II framework, Banque Atlantique seems to be making genuine efforts to ask for alternative, more flexible guarantees. It is considering launching warrantage and leasing products.

Banque Atlantique received 42 credit requests from PIMELAN for a total amount of FCFA 1.125 bn. Disbursements are conditioned to the finalization of negotiations with SAHFI, either to benefit from the PIMELAN guarantee or to adapt the conditions of the PMEA guarantee.

BOA's interest in agriculture seems rather limited. The recent launch of its leasing product could offer potential for agricultural equipment loans.

BOA has 32 branches in all the regions of Niger except from Diffa. It is not active in agriculture credit currently and has no dedicated resources. It does not have a dedicated agricultural loan product; however, its traditional credit product has flexible repayment schedules: grace periods, quarterly repayments, etc. The maturity of BOA's credits are between 36 and 60 months, with an interest rate of 12% per year on the remaining balance. Moreover, BOA recently launched a leasing product (6-7 months ago) that could be applied to agricultural equipment. BOA has granted fewer than 10 leasing products so far.

The PIMELAN constitutes an opportunity for BOA to start financing agriculture. It has received 12 credit requests, most of them linked to irrigation. Disbursements are conditioned to the finalization of negotiations with SAHFI, either to benefit from the PIMELAN guarantee or to adapt the conditions of the

PMEA guarantee. BOA is also finalizing a partnership with the FISAN for the financing of around 238 farmers or farmers' groups in Tahoua and Agadez. BOA expects the FISAN to follow up on the loans.

BOA proposes refinancing facilities to ACEP. However, developing this activity is not part of its strategy, as it sees the microfinance sector as highly risky.

BOA already has a partnership with IFC: a USD 3 m portfolio guarantee dedicated to the SME portfolio. The guarantee is constantly mobilized at more than 90%.

BSIC recently showed interest in agricultural credit. However, a change in the top management team led to the activity being suspended in June 2020.

Banque Sahélo-Saharienne pour l'Investissement et le Commerce (BSIC) has 15 points of service. Early 2020, it recruited a resource dedicated to the development of agricultural SME finance. The initial strategy was to create an agricultural credit department. BSIC started agricultural credit within the framework of a pilot program. It disbursed 15 credits totaling FCFA 4 m to cooperatives, a federation of unions comprising 3,000 members, and a few women's groups (15 to 30 members). The credits were well repaid. However, a change in the top management hindered the development of the activity, which was suspended in June 2020.

The new CEO accepted to start a partnership with the PIMELAN. Within this framework, BSIC has received 21 credit requests and accepted 18 of them for FCFA 415 m, essentially for individual promotors. Under this partnership, BSIC accepted to lower its interest rate from 12.5% per year to 11% per year. The agricultural SME manager has the flexibility to adapt repayment schedules to the financed activity. He relies on sectorial cards developed by the RECA.

BSIC has had a bad experience financing microfinance and wouldn't be interested in getting involved in such credits again.

BSIC has no current link with IFC.

BAGRI

Niger has a public development bank whose purpose is to finance agriculture. It has the most extensive rural network, aside from ASUSU. BAGRI recently faced some difficulties that has hampered the launch of new partnerships and caused savings withdrawals.

The seventh-largest bank in Niger in terms of its total balance sheet, Banque Agricole du Niger (BAGRI), a public bank launched in 2011 at the instigation of the State, is a universal bank. This choice was made in accordance with the financial authorities' strategy to limit covariate risks linked to the concentration of the portfolio on a single sector (internal resources, 2020). It was created to provide the agro-pastoral sector with a permanent financing mechanism, notably to promote the development of the Nigerien agriculture and to help improve banking services in rural areas. It has obtained accreditation from the WB's Climate Adaptation Fund and receives financing from the Green Climate Fund as part of an IFAD partnership.

BAGRI currently has a network of 26 branches, 20 of which are outside Niamey, and covering all regions of Niger. Each region, except for Agadez and Diffa, has three branches in different locations.

A few months ago, there were discussions about the privatization of the bank, which is currently 60% owned by the State. This caused some confidence issues with clients and savings withdrawals. It also slowed down the launch of partnerships, as well as the negotiation of refinancing lines (BOAD, BAD, BIDC, Africeximbank) and guarantees (FAGACE).

BAGRI is developing its activity with small farmers in partnership with many projects. These farmers currently represent 17% of its credit portfolio. This proportion has increased considerably in recent years.

BAGRI's agricultural loan portfolio is largely concentrated in the hands of big commercial farmers, and small to mid-sized transformation units (sugarcane, maize, milk, etc.). BAGRI has also developed its activity towards small farmers mainly through credit to cooperatives, sometimes with a guarantee from the union.

BAGRI has an agricultural credit department with around 15 people dedicated to this activity, including three at the head office. It has developed good expertise in agriculture.

BAGRI also grants credit to informal farmers' organizations (15-30 members) and individual smallholder farmers, within the framework of projects and programs proposing matching grants. It is partnering with a large majority of agricultural development projects that have a credit component: Luxembourg cooperation through NIG025 and NIG801 in the regions of Dosso, Zinder and Agadez; IFAD through the family farming development program (Pro DAF), in the regions of Diffa, Zinder, Maradi and Tahoua; AFD through the rural poles project (PPR) in the regions of Tahoua and Agadez; and, PAPI and PECEA (Swiss Cooperation).

By way of example, as part of the Lux Dev projects, BAGRI disbursed between 5,000 and 6,000 credits in the Dosso region, most of which benefitting smallholder farmers.

BAGRI is not willing to further develop its direct lending activities to smallholder farmers. It would be interested in developing its partnerships with MFIs and/or value chain intermediaries such as cooperatives.

BAGRI started to lend directly to smallholders or farmers' organizations because it is part of its mission to serve everyone. However, BAGRI face the same constraints as any commercial bank regarding its revenue and cost structures. Hence, directly financing smallholders is not profitable for the bank. The credits disbursed to smallholders within the framework of projects and especially NIG25 were not repaid properly (see 4.4) because BAGRI did not have the operational capacities to carry out a proper field follow-up of the credits, which is key considering the profiles of the beneficiaries. BAGRI does not want to develop these operational capacities, as it cannot find a suitable business case for the management of such small credits. Hence, it would rather provide refinancing to MFIs and/or propose loans to cooperatives.

Regarding partnerships with MFIs, BAGRI has signed regional partnership agreements with a few SFDs such as Yarda, Hinfani or Proxifina. The SFD can ask for refinancing lines of 12 to 24 months, or for a one-off seasonal credit, to finance a specific crop production. However, even if this kind of partnership makes a lot of sense, this activity is not performing very well. BAGRI has high expectations from public initiatives to strengthen the microfinance sector.

Its lending activity through cooperatives is constrained by the limited number of cooperatives able to propose guarantees that comply with Basel II standards. As many smallholders are not properly organized, BAGRI has also started to grant loans to traders proposing prefinancing to smallholders (see 3.3.1). Moreover, it is in talks over a large-scale project promoted by Tunisian private company Cillium, which will equip and train six farmers in automated water management. Each farmer will cultivate 10 ha and start a greenhouse nursery.

BAGRI would be interested in a partnership with IFC for a long-term and affordable credit line dedicated to agriculture, as well as for TA.

Another major limitation for BAGRI is the lack of adapted refinancing sources. BAGRI is currently looking for long-term affordable refinancing sources (5-7 years – see above) to develop its agricultural investment loan portfolio.

BAGRI would also need two kinds of TA:

- TA to end-beneficiaries, in order to increase their managerial capacities,
- TA to the bank to improve its tools and processes for agricultural credit, especially through digitization and acquisition of adapted software.

Appendix 3: List of banks and other financial institutions

IMMATRI-CULATION	DESIGNATION	SIGLE	DATE D'AGREMENT	MONTANT DU CAPITAL (a)	REPARTITION DU CAPITAL (a)			TOTAL BILAN (**) (a)	RESEAUX (***)	NOMBRE DE COMPTES	EFFECTIFS		
					NATIONAUX		NON-NATIONAUX				CADRES	EMPLOYES	TOTAL
					ETAT	PRIVES							
	BANQUES (14)			**126 561**	**43 801**	**17 115**	**65 645**	**2 218 486**	**190**	**925 344**	**917**	**1 076**	**1 993**
H0064B	- Société Nigérienne de Banque	SONIBANK	11/09/1990	12 000	3 826	4 036	4 138	**437 144**	20	118 150	203	144	347
H0038Y	- Bank Of Africa Niger	BOA-NIGER	22/04/1994	13 000	0	1 127	11 873	**356 661**	32	296 584	59	226	285
H0095K	- Ecobank Niger	ECOBANK	14/01/1999	10 962	10 110	0	852	**263 040**	14	113 737	17	200	217
H0040A	- Banque Internationale pour l'Afrique au Niger	BIA-NIGER	27/02/1980	19 188	1 059	3 691	14 438	**229 626**	18	71 108	129	73	202
H0164K	- Banque Agricole du Niger	BAGRI	07/02/2011	10 084	5 828	4 256	0	**172 649**	24	78 040	74	118	192
H0136E	- Banque Atlantique Niger	BANQUE ATLANTIQUE	07/10/2005	11 620	0	2 351	9 269	**161 207**	19	100 685	89	62	151
H0110B	- Banque Sahélo-Saharienne pour l'Investissement et le Commerce Niger	BSIC-NIGER	25/07/2003	11 000	10 998	2	0	**151 700**	23	52 019	101	67	168
H0174W	- Orabank Côte d'Ivoire, Succursale du Niger	-	05/06/2013	0	0	0	0	**138 552**	10	31 623	80	50	130
H0210K	- Coris Bank International, Succursale du Niger	-	18/09/2018	0	0	0	0	**129 203**	4	8 757	36	15	51
H0081V	- Banque Islamique du Niger	BIN	03/06/1997	16 500	1 005	0	15 495	**81 826**	14	45 092	37	57	94
H0208H	- Banque de l'Habitat du Niger	BHN	26/07/2018	11 800	10 148	1 652	0	**29 728**	8	6 928	52	16	68
H0168P	- CBAO, Groupe Attijariwafa bank, Succursale du Niger	-	20/03/2013	0	0	0	0	**28 162**	1	2 515	7	12	19
H0057T	- Banque Commerciale du Niger	BCN	19/09/1988	10 407	827	0	9 580	**26 342**	2	0	21	29	50
H0193R	- Banque Régionale de Marchés, Succursale du Niger	-	11/06/2015	0	0	0	0	**12 646**	1	106	12	7	19
	ETABLISSEMENTS FINANCIERS (6)			**12 625**	**0**	**12 625**	**0**	**40 312**	**1 131**	**0**	**81**	**2 102**	**2 183**
H0205E	- AL-IZZA Transfert d'Argent International	AL-IZZA	13/11/2017	3 000	0	3 000	0	**16 899**	0	0	0	0	0
H0209J	- Niger Transfert d'Argent	NITA	26/07/2018	3 000	0	3 000	0	**11 047**	850	0	63	1 955	2 018
H0204D	- Bureau National d'Intermédiation Financière (BNIF AFUWA)	BNIF-AFUWA	13/11/2017	3 000	0	3 000	0	**6 781**	280	0	12	145	157
H0129X	- Société Sahélienne de Financement	SAHFI	14/06/2005	3 625	0	3 625	0	**5 585**	1	0	6	2	8
H0250J	- ZEYNA	-	02/08/2021	0	0	0	0	**0**	0	0	0	0	0
H0251K	- AMANA Transfert d'Argent et Finance	-	02/08/2021	0	0	0	0	**0**	0	0	0	0	0
	TOTAL ETABLISSEMENTS (20)			**139 186**	**43 801**	**29 740**	**65 645**	**2 258 799**	**1 321**	**925 344**	**998**	**3 178**	**4 176**

(a) : Montants en millions de FCFA
(*) : ou de Décision d'autorisation d'installation
(**) : Données provisoires
(***) : Nombre d'Agences et de Bureaux constituant le réseau

Source : Annual report 2021 COBAC

Appendix 4: Key figures – PRADEL

Financial institutions	Number of projects financed	Number of beneficiaries	Amount (FCFA)	Repartition		
				Grant (FCFA)	Personal contribution (FCFA)	Credit (FCFA)
YARDA TARKA (Tahoua)	125	1808	428 025 580	236 519 068	42 831 492	148 675 020
ARK Doutchi (Dosso)	135	1441	342 570 182	193 744 161	31 456 573	117 369 448
HINFANI (Dosso)	68	179	88 918 063	41 631 853	8 891 807	38 394 403
CAPITAL FINANCE (Dosso)	82	231	205 374 051	107 960 213	20 207 446	77 206 392

Appendix 5: Research framework and methodology

Research framework

To address the study's objectives, the research plan had been defined as follows:

Market review based on market intelligence and interaction with key stakeholders	
Identify major production hubs of key crops, and their respective production techniques, and marketing schemes	What are key crops cultivated in the main production areas of Niger?
	What irrigation techniques are these associated with?
	What other agricultural inputs are required for them?
	Where and how are harvests marketed ?
Cost-benefit profile of irrigation technologies that are used/can be feasibly used and identify which technology has the highest cost-benefit for the respective crops identified.	For each selected crop and production area, what are the most profitable irrigation technologies?
	For each selected crop and production area, what are the technical constraints associated with each assessed technology
Identify existing agri-commercial models for irrigation equipment and agri-inputs including financing mechanisms for farmers and equipment providers	In each selected area and cultivation system, who are the main irrigation equipment and inputs distributors?
	What kind of products and services (installation, maintenance, etc.) do they propose?
	Do they propose any kind direct or indirect financing scheme to facilitate the acquisition of irrigation equipement or inputs? If yes, which, and what are the minimal requirement to access this services?
	Do they benefit from any direct or indirect financing scheme from equipment and inputs suppliers? If yes, which, and what are the minimal requirement to access this services?
Identify the key stakeholders involved in the commercial and financial schemes such as irrigation equipment providers and agri-inputs providers, commercial farmers and farmers' cooperatives, offtakers or agro processors, aggregators or traders, financial institutions, public entities, etc.;	In each selected area and cultivation system, who are the main players in the agricultural value chain (cooperatives, offtakers, agro processors, etc.)?
	Are there some other private or parapublic institutions (e.g. NGOs, RECA and local afgricultural chambers, etc.) with relevant interactions with the value chains (e.g., technical assistance for agricultural production, land tenure securing, etc.)
	Does any of these actors currently offer prefinancing services to individual farmer or producers' groups to invest in the production ?
Identify strategic imperatives of the main private non-financial players operating in the country and their main constraints to growth;	For each identified actor, for each selected crop and production area: what are their current strategies in terms of support to the agricultural production (and especifically to the development of irrigation)?
	What are the main limiting factors to their ambitions or capabilities
Demand for irrigation equipment	
Provide a segmentation of irrigation equipment together with existing and potential users (farmer cooperatives, individual farmers, businesses, etc) including share market of dominant players;	For each selected crop and production area, how is the production shared between individual producers, producers' groups (men and women) and/or cooperatives, etc.?
	Do these groups use differentiated irrigation technologies ? If yes, what are the corresponding matches ?
Assess perceptions of farmers, irrigation equipment suppliers and other stakeholders on irrigation technology and financial capability to purchase the irrigation technology;	How do the different groups of producers (i.e. individual famers, producers' groups, etc.) motivate their choice to invest or not in irrigation equipment?
	If they do invest, what are their resons to choose one or another of the available irrigation solutions?
Assess access to finance trends for irrigation equipment (type of credit, type of subsidy, interest rates, guarantees, etc.)	What is the current access to commercial finance of farmers?
	How do farmers currently finance irrigation equipment in Niger? To which extend does this offer meet their needs (outreach, type of product, etc.)
	What do producers consider as their main constraints to access finance solutions? Do they think these will be overcome soon? Why?

Financial institutions involved in the agriculture sector and enabling environment	
Assess financial sector's readiness and appetite to finance irrigation	Who are the main players in commercial agricultural finance today in Niger, who are they targeting and what is their outreach? (including Public Development Banks)
	Among them, who are the most dynamic and motivated to develop their agricultural finance portfolios?
Assess enabling environment	Are there any specific challenges or opportunties at policy, legal and regulatory level that could have an influence on the development of a commercial irrigation financing scheme in Niger?
Identify potential partners for an irrigation financing scheme, among commercial banks, MFIs and PDBs	Which are the institutions showing the strongest appetite to enter an irrigation financing scheme?
	Which are the institutions presenting satisfying financial and governance profiles?
	Which are the institutions that are in the best position to finance the targeted beneficiaries in terms of strategic positioning/orientations, operational capacities and delivery channels?
Identify bottlenecks and capacity gaps for financial institutions to financing irrigation	What are the main bottlenecks identified by these institutions to finance irrigation
	Which kind of public or private incentive(s) could ease the set up of an irrigation financing scheme? (matching grant, risk sharing mechanisms, operationnal partnerships with VC players, ...)
	What kind of capacity building would the financial institution need to implement the irrigation financing scheme in a satisfying manner?
Irrigation financing schemes	
Review existing financing models from the government, donors, NGOs	Which existing financing schemes/models can be mobilized to increase access to irrigation in Niger?
	What are the characteristics of these schemes in terms of: - taget beneficiaries (eligibility criteria) - loan product (amount range, repayment schedule, interest rate, associated guarantees…) - incentives for the private sector (concessionnal resources, guarantees or other risk sharing mechanisms, ...) - current scale and development perspectives
	To what extent do these characteristics correspond to the needs and expectations of the targeted beneficiaries of the study (smallholder farmers) on one hand, and to partner financial institutions (when they exist) on the other hand?
Assess the scaling up potential of existing schemes	Is the scheme deployed where potential for irrigation and demand for irrigation equipment actually exists?
	Does the distribution channel of the scheme ensures availability of both equipment and funds to finance this equipment?
	Does the offer correspond to the needs of the Nigerian farmers? (in terms of equipment, of financial product, of total investment cost…)
	Is the funding source available, or does the scheme allow an easy mobilization of additional resources?
Identify potential challenges / risks encountered by these schemes	Which are the difficulties and challenges encountered by the existing schemes / models that should be anticipated / overcome to scale up commercial finance for irrigation in Niger?

Key questions per stakeholders' category

The table below lists the different types of stakeholders to be met in Niger, as well as key questions to be addressed during interviews.

Type of actor	Objectives
Financial institutions	Identify the current supply of credit for agriculture in general and irrigation in particular, and the volumes of financing Specify the conditions of the proposed credits (individual or collective beneficiaries, cost, maturity, eligibility, expected guarantees) Identify the perception of the potential market and the constraints for irrigation financing Identify the motivation to participate in an irrigation financing scheme and the possible conditions Identify the possible needs for support
Input suppliers (in the regions) and equipment suppliers (almost exclusively in Niamey)	Assess their knowledge of different technical solutions Assess the existence of supply chains for irrigation equipment If so, assess the regularity of supply, If yes, assess the regularity of supply, and the capacity to manage spare parts inventories Assess the capacity to supply inputs (remove other limiting factors to production) Identify the costs of the different equipment/facilities Assess the capacity to ensure the distribution of equipment to producers ("last mile") Assess the capacity to ensure the maintenance of the equipment Assess the interest in being involved in an irrigation financing scheme (internal financing capacity, sharing of credit risk, sharing of operational costs related to the financing scheme)
Cooperatives	Evaluate the level of structuring Assess their knowledge of the different technical alternatives for irrigation Assess their capacity to function as relay points for the distribution of equipment/spare parts and maintenance Assess the capacity of the cooperative to manage credit to be retroceded to producers

	Bring up the needs and expectations of their members in terms of irrigation equipment, their capacity and their willingness to finance this equipment with credit. Assess the current access to finance of the cooperative itself, and of the producer/group members Better identify the existing credit offer, including potential financing schemes Assess the interest of the cooperative to participate in a credit irrigation financing scheme
Sample of large producers, if relevant and existing, chambers of agriculture and RECA	Assess the level of security of the activity (access to land and other factors of production); to be linked with eligibility criteria + gender and inclusiveness issues Assess the current access to financing and satisfaction with the existing offer Assess the appetite for financing irrigation devices on credit
Buyers / agro processors	Understand business volumes and supply organization Verify the existence of supply contracts or a historical/trust relationship with producers Assess interest in being involved in an irrigation financing scheme (internal financing capacity, credit risk sharing, sharing of operational costs related to the financing scheme)
Local project/program representations + NGOs/IEG	Identify the needs and expectations of producers in terms of irrigation equipment, their ability and willingness to finance this equipment with credit. Identify potential synergies between public funds and commercial credit supply: partial subsidy, technical support linked to credit, other… Identify potential competition between commercial and subsidized irrigation equipment supply NB: when relevant, repeat the questions for input and equipment suppliers
Deconcentrated services, agricultural extension	Identify the needs and expectations of producers in terms of irrigation equipment and their ability and willingness to finance this equipment with credit. Better identify the existing credit offer, including potential financing schemes Assess the capacity to provide technical support on the use of alternative irrigation solutions Check the existence of public hydro-agricultural development initiatives Assess the functionality of land security services/other types of services that can enhance eligibility of producers

Appendix 6: List of people interviewed

Name	Institution	Function	Phone number	Email
Niamey				
1. Sidi Ali	FISAN	Directeur Facilité 1		Sidi.ali@fisan.ne
2. Ali Moha	PIMELAN	Coordonnateur National	96977108/90484887	alimohakiri@gmail.com
3. Kalilou Ibrahim	BOA	Directeur des engagements	90273590/96893890	ikalilou@boaniger.com
4. Toure Mahamane Elhadji	Banque Atlantique	Desk Agri	91490506	Toure.mahamane@banqueatlantique.net
5. Ganda Seydou Seyni	Nirritech	Directeur Général	90311015/96287430	Seyni_ganda@yahoo.fr
6. Lawal Attoumane Arami	SAHFI	Directeur d'exploitation	96897670	alawal@sahfi.ne
7. Maman Lawal Mossi	BAGRI	Directeur Général	89535305	Mossi.lawal@bagriniger.ne
8. Hassane Yacouba Kaffa	Capital Finance	Coordonnateur des projets	96159351/92729627	hykaffa@gmail.com
9. Khader	AFD	Responsable équipe projet	20 72 22 20 / 20 75 24 84	
10. Aimée Mpambara	Banque Mondiale	Représentante de la Banque Mondiale au Niger		ampambara@worldbank.org
11. Ibahim Na Allah	APSFD	Directeur Général	9698997	nigerapsfd@gmail.com
12. Kabirou Alzouma	ARSM	Secrétaire exécutif		kabiroualzouma@gmail.com
13. Michel Maricaux	Luxdev	Coordonnateur Technique Pays	80060613	Michel.maricaux@luxdev.lu
14. Issa Chaibou	FACEC	Directeur Général		Magagi.issa@yahoo.fr
15. Amza Tahirou	Proxifina	Président du Conseil d'Administration	80525159/96974420	opaniger@yahoo.fr
16. Moussa Maihatchi Chipkao	Centre Africain d'Agrobusiness	Directeur Général	96028153/80048082	Maiatchi2@yahoo.fr
17. Michelet Beaubrun	ACEP	Directeur Général		dg@acep-niger.com
18. Amadou Salifou	BSIC	Responsable crédit agricole	96767773	salifouamadou@bsic.ne / amadosalif@yahoo.fr
19.	Yarda Tarka Maggia	Directeur Général	97904510	
20. Patrick Delmas	RECA	Assistant technique	91002171	
21. Abdoulaye Maizama	HCI3N	Secrétaire générale du HC-I3N	96 96 50 69	maizama@yahoo.fr
22. Bachir Ousseini	SPIN	Secrétaire permanent		bachousseini@yahoo.fr

23. Zakou Aminata Samaké Boubacar	Millénium Challenge Account MCA - Niger	Directrice du Projet Irrigation et Voies d'Accès aux Marchés	80 07 43 69	aminataboubacar@mcaniger.ne
24.Kerstin Laabs	KFW	Directrice de la KFW au Niger		Kerstin.Laabs@kfw.de
25. Magdalena Pruna	DUE	Cheffe secteur – Développement rural, Sécurité alimentaire et nutritionnelle	91316026	magdalena.pruna@eeas.europa.eu
26.Abdou Maman Kane	Tech-Innov / Tele-irrigation	Directeur Général	90326035 / 96966289	infos@tele-irrigation.net
27. Ouma Katouma Bizo	DAC/POR	Directrice	90486084	djamil_88@yahoo.fr

Name	Institution	Function	Phone number	Email
Maradi Region				
1. Guéro Magalé Abdourahamane	CRA Maradi	Secrétaire Permanent	90526346/96509447	guerotasnim@gmail.com
2. Abdoulaye Soumaila	PRODAF	Coordonnateur	97594610	Abdoulaye71soum@gmail.com
3. Kabirou Mahaman	DRA	Directeur régional	96276903	kbimahaman@gmail.com
4. Salissou Alajinate	UC de Djiratawa	Président	96188508/84832089	
5. Sabo Abarchi	ONAHA	Directeur régional	91861189	saboabarchi@gmail.com
6. Sanoussi Ibrahim	ONAHA	Chef Station de pompage	90474819	
7. Oumarou Ibrahim	ONAHA	Directeur de périmètre	90455139	
8. Moustapha Ali	MECAT	Directeur	96899743	Moustaphali2007@yahoo.fr
9. Mohamed	BAGRI	Responsable du portefeuille agricole	98046752	
11. Abdoul Mansour Nassamou	GMA	Commercial	97163727	
Tahoua Region				
12. Tassiou Moussa	PPR	Coordonnateur régional	80075862/96964728	tassagrickan@yahoo.fr
13. Boueye Daouda	BAGRI	Chef d'agence	97883968/90540501	Boueye.daouda@bagriniger.ne
14. Abouzeidi Yahaya	Yarda	Chef de guichet	96457216	nscasapi@intnet.ne
15. Laouali Souley Ismaël	Capital Finance	Chef d'agence	95955489	
16. Kiémogo Aboubacar	CRA	Secrétaire permanent	99915831	

17. Souleymane Issa 18. Harouna Saidou	Opérateurs économiques	Commerçants Intrants agricoles	99753439	
19. Mme Ramatou Rahama	IPNT	Transformatrice/Pâtisserie	89686000	
Agadez region				
20. Kaou Mamadou	CRA	Secrétaire permanent	96263422/90672161	bamakaou@gmail.com
21. Elhadj Ahmed Ouha	CRA	Président	97715251/91004711	anoumed@yahoo.fr
22. Issaka Dan Mata Mahamane B.	BAGRI	Chef d'Agence	91001000/98111511	
23. Madougou Nouhou	FRUSCA	Secrétaire exécutif	96585343/84405461	
24. Mme Chaibou Mariama	DRA	Directrice adjointe	96604520	
25. Adam Mohamed	FRUSCA	Intermédiaire commercial	91694411/96463438	
26. Sahirou Abdou	FIDELE Consulting	Consultant principal	96964391/80443859	sahiroua@yahoo.fr
27. El Hadj Kader /Mohamed Illa	UCMA	Exploitants et commerçants	91005488	
Tillabery region				
28. Ganda Seydou	Nirritech	Manager Directeur Général	96 28 74 30/ 90 31 10 15	
29. Bibata arimou	Union des Groupements féminins Albarka de Djamballa	Présidente	92256661	
30. Karimoun Hassane	Coopérative rizicole de Djamballa	Président	80 39 59 56	
31.	FCMN Niyya			
32. Alio		Revendeur laitue à Tillaberi		
33. Raba Hanna			96 29 38 71	
34. Eliad Kiauta Kadri			94922928	
35.	PRACC			
36.	Chambre Régionale de l'agriculture			
37.	Sécretariat permanent du Code Rural			

38. Seini Saidou	Direction Départementale de l'Agriculture		89 28 69 88	
39. Seini Daouda	Direction Départementale Génie Rural Tillaberi			
Dosso region				
40. Khady Zomaré	Groupement féminin maraicher GOMNI de KOGARMA, Commune de SAKADAMNA		99 87 85 10	
41. Ibrahim Zanguina	Ets FUSA'A	Responsable	96 88 75 15	
42. Abdou Zika Sombeizé	ONG Action pour une Gestion des Risques Climatiques (AGRC)			
43.	PARIIS	Chef d'antenne PARIIS Dosso		
44. Mahamadou Aminou Salifou	Chambre Régionale de l'agriculture Dosso	Comptable	9669 00 22	
45. Sami	DR ONAHA Dosso		96 13 64 31	
46. Slissou Bawa	DRA Dosso		96 58 43 94	
47. Arachi Dille	Génie Rural Dosso	Directeur Régional	96 99 21 17	