UNCDF
Impact Capital for Development

CASE STUDY

The Renewable Energy Fund for Resilience in Burkina Faso (FERR-BF)

2019-2023

ACKNOWLEDGEMENT

As part of Clean Energy 4 People Resilience (CE4PR), the Renewable Energy Fund for Resilience in Burkina Faso (FERR-BF) is an innovative financing project implemented in Burkina Faso between 2019 and 2023 by the United Nations Capital Development Fund (UNCDF), with the financial support from the Grand Duchy of Luxembourg (Ministry of Environment, Climate and Sustainable Development (MECDD). This document was prepared by the Inclusive Digital Economies team at UNCDF, which works more specifically in the development of solutions for clean energy financing.

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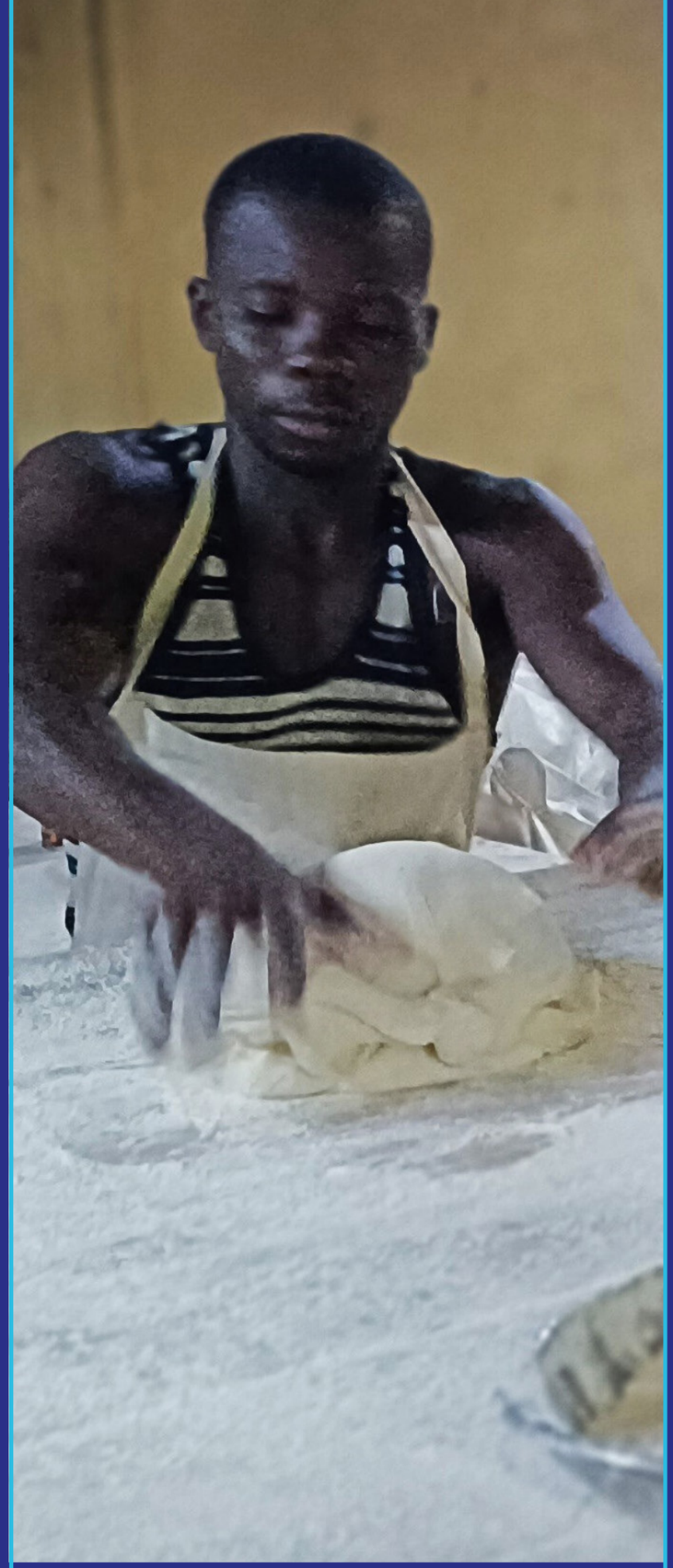
Photo credit: UNCDF / Touré Monia Roxane



Preparation of baguettes at the Re Kyi Wo Yi Bakery in Reo
UNCDF / Touré Monia Roxane

CONTENT

INTRODUCTION

With 80 percent of its population without electricity, Burkina Faso is lagging behind, greatly hampering its economic and social development. For the low-income population, whose GDP per capita was $893 in 2021, access to energy remains too expensive. Unemployment among young people and women is high. Primarily agricultural, the country suffers from a double burden: the effects of climate change and persistent political instability. Access to clean, safe and affordable energy is a prerequisite to start taking off economically. Burkina Faso is thus aiming for a national electrification rate of at least 50 percent by 2025-2030, taking advantage of the abundant solar resources throughout the country and promoting the creation of green jobs.

To support Burkina Faso's priorities, the United Development Capital Fund (UNCDF), with financial support from Luxembourg (€3.2 million), set up an innovative program: the Renewable Energy Fund for Resilience in Burkina Faso (FERR-BF) at the end of 2019, which will end in December 2023. Its objective: to support the development of energy service enterprises (ESCOs) in Burkina Faso and, more broadly, the renewable energy sector ecosystem to create income-generating activities for the most vulnerable populations, women, young people, displaced, smallholder farmers, micro-entrepreneurs.

During its mandate, through the FERR-BF project, UNCDF was thus able to provide technical assistance, grants, and loans to 16 companies selected following a call for projects (from a long list of over 60 candidates). The project supported ten ESCOs, three incubators, two microfinance institutions and a digital payment solutions provider. These winning companies were selected based on the commercial viability of their project, their organizational capacity, the technology used, their impact on the target populations, the added value of the project and the CO2 emissions avoided.

The four project stories presented in this case study are representative of how the FERR-BF has been able to nourish the ecosystem of actors essential to the emergence and development of renewable energies in Burkina Faso. They show the interactions between the five main types of partners in this ecosystem: ESCO, fintech-financial service provider, incubator, payment service provider, and public authorities (ANEREE, ABER, ST-PIF).
Introduced from the perspective of energy service companies, these four cases address the themes of clean cooking, solar irrigation for agriculture, and the organization of productive, agricultural, artisanal, and commercial activities, powered by solar energy. They demonstrate the relevance of solutions based on renewable energies to solve the challenges associated with climate change mitigation and adaptation. The feedback from the twelve other companies in the FERR-BF cluster is available in a separate booklet.

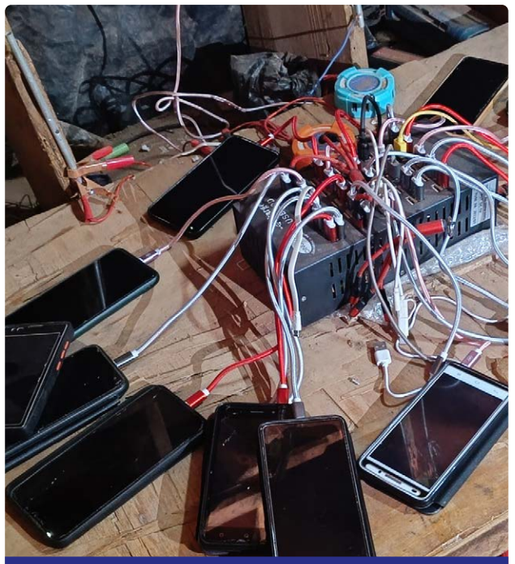
In total, over the period of implementation of the project, between 2019 and 2023, and despite a worsening of the security situation that may have complicated the work of the various actors, but which at the same time forced them to show agility, the results are tangible and very satisfactory. More than 95 percent of the objectives of the FERR-BF program have been achieved. To ensure the success of this programme, UNCDF put in place a regular monitoring and evaluation system, namely a results framework with indicators associated with the transmission of quarterly reports by all beneficiaries and partners, frequent meetings, the disbursement of grants as soon as results are achieved, as well as field visits coupled with meetings with the final beneficiaries of the facilities to collect their views and experience.

Thus, FERR-BF has so far supported 76 partners, including 60 incubated companies and 16 companies receiving grants and loans. The project also leveraged over $6.8 million in new investments (including $1.9 million from UNCDF). Over 9,600 clean energy equipment have been sold. Nearly a thousand jobs have been created. Around 10,000 tons of CO2 have been avoided. But above all, more than 48,200 final beneficiaries, among the most vulnerable, have seen their lives change and become more autonomous and resilient.

So far, FERR-BF has supported **76 partner entities, including 60 incubated companies and 16 companies** that have received grants and loans.

The project has also **raised more than $6.8 million with a high leverage effect** (including $1.9 million from UNCDF). **More than 9,600 clean energy devices have been sold.**

Nearly a **thousand jobs** have been created. Around **10,000 tonnes of CO2** have been avoided. But most importantly, **over 48,200 final beneficiaries**, among the most vulnerable, have seen their lives change, becoming more autonomous and resilient



Mobile charging point in a shop in Kouakoualé.
UNCDF / Touré Monia Roxane

Women of the Nabonswende Cooperative
UNCDF / Touré Monia Roxane

Cosse d'haricot cornille provenant des cultures de la coopérative Relwendé.
UNCDF / Touré Monia Roxane

FRES / YELEEN BA

15 STREETLIGHTS THAT NOW ILLUMINATE THE VILLAGE

21 KWP VERSATILE SOLAR PLATFORM, OVER 20 BUSINESSES CONNECTED

OVER 100 JOBS CREATED

A REDUCTION IN GREENHOUSE GAS EMISSIONS OF ABOUT 20 TONNES OF CO2 PER YEAR

FRES/YELEEN BA, THE ARCHITECT OF PRODUCTIVE SOLAR PLATFORMS AND MICROGRIDS

Rouamba Salfo, originally from Manga, owns and manages a fish shop in the town of Kouakoualé, located about twenty km south of Bobo-Dioulasso. He is the very first beneficiary of the multifunctional solar platform installed in the village by FRES/ Yeleen Ba, a project developer and solar electricity service provider in Burkina Faso. "When we met the promoters of this platform, as part of an information session, I immediately joined the project. Before being connected to the platform, I used solar panels to power my freezer and light the shop, but the device was not powerful enough, knowing that storing fish is tricky. With the need to replace the battery every six months, that cost me a lot of money," says Rouamba Salfo. "Thanks to the FRES/Yeleen Ba installation, I am able to sell seven boxes of twenty-kilogram of fish per week! The market day is when it's the busiest," he adds. At a rate of CFA franc 300 per kWh, the fish industry consumes between CFA franc 6,000 and 6,500 of solar energy per month. Rouamba told us about his future dreams: "My living conditions have improved, my diet is more varied and above all, I am able to support my large family, who stayed in Manga. In

Multifunctional solar platform of FRES / Yeelen Ba in Kouakoualé
UNCDF / Touré Monia Roxane

15 STREETLIGHTS
of the village provide safety and light up the return of women working in the surrounding fields, allowing for the continuation and development of activities.

Rural electrification in the village of Kouakoualé, powered by FRES.
UNCDF / Touré Monia Roxane

the near future, I hope to be able to increase the number of freezers in my shop and establish a catering outlet specializing in fish for my wife".

On the outskirts of the village, the multifunctional solar platform installed by FRES/Yeleen Ba feeds an agricultural transformation hub managed by women (press, mill, husking machine for millet, peanuts, sorghum, shea butter, etc.). At nightfall, the fifteen lampposts that now light the village provide security and light the return of women working in the surrounding fields, allowing the continuation and development of activities. The students take advantage of the light for their studies, and several scrublands have opened.

The commissioning of this mini solar power plant with its microgrid at the end of 2022 fundamentally changed the lives of the 3,000 inhabitants of Kouakoualé, a town not covered by the national electricity grid. "It started from the needs and demands of the population. People wanted machines for the on-site processing of grains, maize, rice, sorghum, millet, and oilseeds. There were needs also expressed by artisans and traders. We designed this platform and installed 21 kWp, with a remote monitoring system. This versatile solar platform can now power a flour mill, a husking mill, and an oilseed milling machine and serves twenty connected small businesses. Cables were also drawn to electrify the village centre, the health centre that until then had only

21 KWP VERSATILE SOLAR PLATFORM
about twenty small businesses and a health center connected.

A REDUCTION IN EMISSIONS
of greenhouse gases of about 20 tonnes of CO2 per year.

used pico lamps to light the waiting room. We will soon be bringing this solar energy to the village school! ", says Lassina Davou, project manager at FRES/Yeleen Ba. The Dutch FRES Foundation started its activities in the country in 2008. Yeleen Ba, "the big light", is the local commercial version, operating in the Mouhoun loop, in the Hauts-Bassins and the Cascades region.

PAYGO systems and smart meters

In Kouakoualé, the business model set up by Yeleen Ba is simple. For connected businesses, the percent is degressive according to the kWh consumed. There is no fixed price, but a subscription and instalments known in advance: CFA franc 275 per kWh from 0 to 30 kWh; CFA franc 230 from 30 to 50 kWh; CFA franc 180 over 50 kWh. Measurements are taken every month on-site by Yeleen Ba agents using an individual conventional meter installed at each customer's home.

"The PAYGO settlement system is not attached to this type of traditional meter, but that will come. The replacement with smart meters, with a prepayment system and remote control, is part of FRES/Yeleen Ba's business plan for 2024. That makes sense because we have all the technology to implement it. This would allow us to manage more easily, with real-time data, and the guarantee of being paid. For the beneficiary, it means better control of their consumption and therefore better management of their activity, the possibility of paying directly with mobile money", indicates Louis Traore, the CEO of FRES/Yeleen Ba.

To migrate to smart meters, which are now the norm according to regulations in Burkina Faso, Yeleen Ba has begun to approach the energy and IT services company MicroSow and the financial services provider Micro Start, two companies in the renewable energy ecosystem, supported in their strategy by the 2M Incubator as part of the FERR-BF program. MicroSOW equips kiosks with electronic equipment, powered by solar energy. For its part, Micro Start operates in the microfinance sector, offering credit, savings and money transfers, for households and businesses wishing to acquire energy products (improved cooking stoves, solar kits and solar mills). Yeleen Ba is already selling household and collective solar kits connected to a PAYGO payment system in partnership with Orange Money and Solaris Offgrid.

A hundred jobs created

With its thirty employees, Yeleen Ba has an average annual turnover of CFA franc 150 million (approximately $240,000). The commissioning of the solar platform, supported by a grant of $150,000 from the FERR-BF (nearly 80 percent of the total cost, the balance coming from equity), resulted in the creation of numerous jobs. To ensure on-site operation and maintenance, Yeleen Ba recruited four full-time people, including a sales technician to read the meters, a supervisor, a maintenance manager, and three part-time technicians.

The twenty companies connected to the network have also recruited. Louis Traore estimates that there will be one hundred new jobs. Before being connected to the mini-grid, the boss of the Kouakoualé snack bar, for example, worked with only her niece.

Today, due to his success, five more of them are at his side to serve customers. Residents now come to get their drinks from his refreshment bar, to sell them in turn in the surrounding villages, which lack electricity. Not to mention the use of local labour,

Belem Souleymane repairing a motorcycle part in his welding workshop
UNCDF / Touré Monia Roxane

around sixty people, during the construction phase of the platform. Another significant impact of the project is a reduction in greenhouse gas emissions of around 20 tons of CO2 per year.

In the coming months, Yeleen Ba hopes to be able to connect twenty other small businesses, as well as domestic households, which would be a first. The company has a project to extend the multi-purpose platform from 21 kWp to more than 28 kWp. It also aims to build a water tower and wishes to integrate greenhouse horticulture, on 5,000 m2, to benefit the Kouakoualé women's cooperative. Yeleen Ba is now looking for funds to finance all these developments.

Advocating with the authorities

"Investing in renewable energies is really expensive; it pays off in the long term. Banks in Burkina Faso are liquid, but the bank rates between 10 and 12 percent are too high for companies that want to finance such projects.

With rates of three to five percent, this would be bearable and without subsidies. We could then replicate the Kouakoualé multipurpose solar platform at the level of several villages in the region. But at the current banking rate, the cost of energy would not be acceptable for the population," explains Louis Traore.

The director of FRES in Burkina Faso and a dozen other directors of companies selected by the FERR-BF programme thus intend to form a group to raise their complaints and make the need for affordable and secure financing known to the Burkinabe authorities.

Will they be heard? Encouraged by the results of the FERR-BF (95 percent of the objectives have been achieved throughout the project), the Burkinabe public authorities are seeking to support further the development of renewable energies, a pivotal sector for achieving 50 percent electrification at the national level in 2025-2030. At the Technical Secretariat for the Promotion of Financial Inclusion (ST-PIF) level, in particular, "the focus is on regulation and on green finance, which is now at the heart of its new powers enshrined in an order issued in March 2023."

Women of the Nabonswende Cooperative
UNCDF / Touré Monia Roxane

Ingénieurs Conseils Bio Design

ICBD

400 PEOPLE WORK ON PLOTS OF 2500 SQUARE METERS

OVER 20 VEGETABLE GARDENS WITH PRECISION IRRIGATION

OVER 50% INCREASE IN AGRICULTURAL YIELDS

50% REDUCTION IN WATER BILLS

ICBD LAUNCHES INTO MINI SOLAR POWER PLANTS

"The implementation of drip irrigation using solar pumping on these plots has increased agricultural yields by more than 50 percent and reduced the water bill by the same amount. We went from 10 tons of onions per hectare to 23 tons. On five hectares, we expect an annual production of 300 to 350 tons of onions, in three cycles, which will be valued at around CFA franc 60 million (around $96,000), proudly announces Serge Apollinaire Ki, production manager at the company Ingénieurs Conseils Bio Design (ICBD). On the outskirts of Koudougou, a city of 90,000 inhabitants located 100 kilometres from the capital, in the centre-west of the country, about twenty of these market gardens, benefiting from precision irrigation, were created in 2023. Onions, tomatoes, eggplants, cucumbers, and potatoes are now produced there; vegetables marketed in Koudougou and in the region throughout the year. A real boon.

Around 400 people, the vast majority of whom are women, organized in groups, work on individual pieces of land measuring 2,500 m 2. Most of these women were previously involved in subsistence farming, weaving loincloths, running a small business, or without a job.

Titi Josias Kabore - General Director, ICBD
UNCDF / Touré Monia Roxane

INCREASE IN AGRICULTURAL YIELDS
by more than 50% and to reduce the water bill by the same amount

Yameogo Isabelle, Secretary of the Nabonswende Cooperative and Siemde Iseita, President of the Relwendé Cooperative
UNCDF / Touré Monia Roxane

Yameogo Boris, President of the Wendpanga Cooperative
UNCDF / Touré Monia Roxane

The agricultural season started at the end of August. Women are working to turn over the land and set up nurseries.

Harvesting is expected at the end of January. Isabelle Yameogo, president of the Naboswende vegetable farming group, has just activated her badge on the shared well terminal, which has a solar pump. The badge, loaded with mobile money or at ICBD's premises, is connected to a terminal that acts like a toll. It allows the delivery of a certain volume of water at a rate of CFA franc 500 per cubic meter, a cost that also includes access to the plot of land and the advice of an agronomist.

Each group has its own badge. It is then up to women to manage the distribution of water volumes among themselves. "This is a system that we invented, which makes an electronic device and a mobile application interact (...) Our beneficiaries knew the pay-as-you-go for small solar home kits, but not for this agricultural irrigation system. They had to be trained," says Serge Apollinaire Ki. "The project trained us both on aspects of associative life and on the technical aspects of vegetable production", agrees Isabelle Yameogo. "It allowed us to access land, which is rare for women," she continues. We have water available all the time (...) Today, we meet once a month to exchange ideas for the smooth running of our activities and to collect contributions. Everyone gives according to their ability."

Before taking the lead of one of the twenty groups, this 31-year-old mother worked as a hairdresser. Becoming a vegetable grower in addition to her hairdressing business, Isabelle Yameogo was able to increase her income substantially. She shares happily that "Thanks to this vegetable gardening activity, I have improved my hairdressing salon, and I am more involved alongside my husband in our children's food, clothing, health and education needs. I could even buy a bicycle without using a third party."

The women of the Nabonswende Cooperative listening to the recommendations of the agricultural technician from ICBD
UNCDF / Touré Monia Roxane

Like Isabelle Yameogo, Helene Zongo and Boris Yameogo are both managers of a group, women for the former and young students and high school students for the latter. They also received support from the company ICBD to access arable land and water through installations including a borehole, cistern, and solar pump, as well as technical assistance on agricultural processes to optimize yields. "We are currently maintaining onion and tomato nurseries, waiting for the transplanting period. We have already been able to carry out a first test of cultivation in our fields during this rainy season with beans", explains Helene Zongo. "This project allowed us young people to have an activity, to be entrepreneurial, to develop management skills and to act positively on the local community," said Boris Yameogo, 22 years old.

Raise funds

Selected by the FERR-BF programme in November 2022, the company ICBD aimed to deploy a drip irrigation system powered by solar energy in order to significantly increase vegetable production in the Koudougou region.

ICBD was awarded a UNCDF grant of $85,000 for this project, based on performance and paid in three instalments. It is up to the company to raise additional funds in advance, i.e. just over $14,000, to benefit from the first disbursements. The first phase required reactivity from the director and founder of ICBD, Titi Josias Kaboré. "We requested the support of our bank to obtain advances to carry out the initial work. Initially, the bank promised to support us, but at the last minute, it refused to accompany us. Considering that funding provided by the UN or the European Union could be suspended due to political instability in Burkina Faso. She was afraid that she would be left alone to bear the risks. This is what prompted us to call on our network, at home and abroad. First, we managed to raise $20,000, which was repaid in six months at rates ranging from zero to 50 percent. Thanks to this initial capital, we could start activities and receive the first payments from UNCDF. Other acquaintances then agreed to lend us funds to develop our activities. A total of $60,000 was raised," explains the manager. In the future, the director of ICBD may want to turn directly to business angels or venture capital, somewhat repulsed by his banking mishap.

Thanks to the UNCDF grant and the funds raised, ICBD acquired all the equipment needed to deploy irrigation over a large area with photovoltaic panels and solar pumps. The company has recruited two permanent technicians, a solar technology specialist and an agronomist.

Digital developments

ICBD was also able to develop its mobile application adapted to precision irrigation with InTouch, the only fintech partner in the UNCDF cluster. InTouch is a pan-African aggregator of payment solutions and digital services (mobile money, money transfer, telephone credit purchase, etc.), hosting numerous mobile telephone operators and banks. "We did not know them before. InTouch has developed an API application for us to integrate into our platform

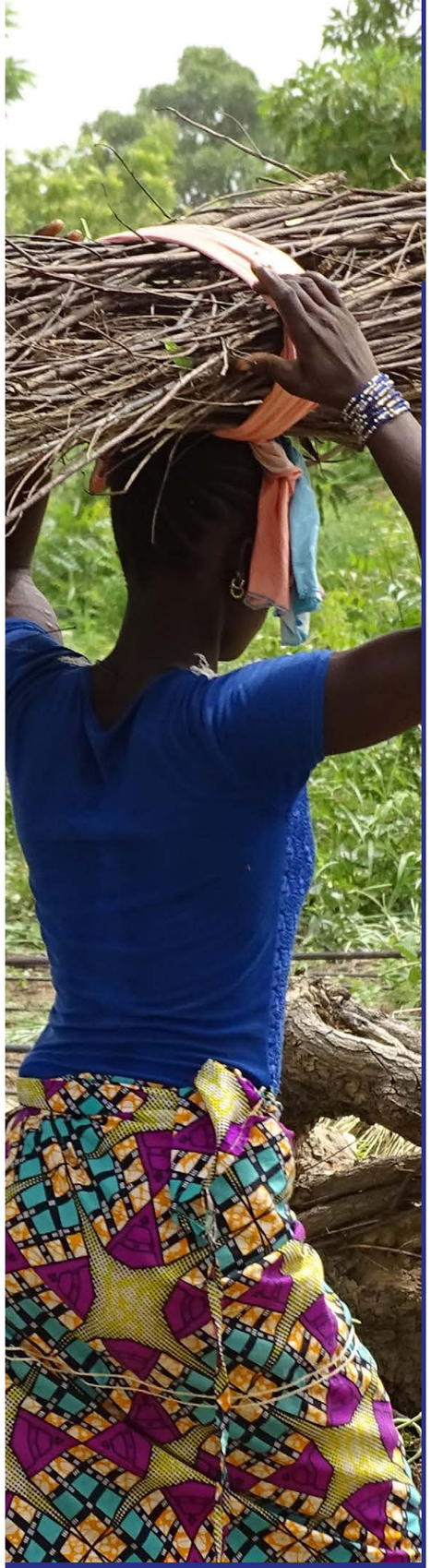
so that groups of vegetable growers can load the badges directly using their mobile phones," says Titi Josias Kabre. The cost charged by InTouch to collect mobile money payments represents 1.5 percent of the amount collected on the platform. A rate that the manager still considers too high.

Thanks to FERR-BF, ICBD has also strengthened its capacities in the field of PAYGO and developed associated web and mobile platforms. Its employees have been trained on gender issues. ICBD has also received support from two incubators: 2iE for solar technology and 2mInvest for project management.

"This is the first time that ICBD has received support of this size, both technical and financial. This is our biggest pumping project in agriculture,"

announces Titi Josias Kaboré with satisfaction. For the company created ten years ago, the project initiated for the first time the development of a genuine mini photovoltaic power plant, including high-power panels. In one year, ICBD will have seen its turnover double to CFA franc 25 million between the end of 2022 and the end of 2023.

"Everything is in place. The results are really positive. Women carry out their activities; they have been trained to use badges and PAYGO, and they are acquiring knowledge about organic farming. They are trained to make and use natural fertilizers such as bokachi and magro," explains Serge Apollinaire Ki. "We are now receiving requests from other women who would also like to farm a plot, but we are running out of space! adds Titi Josias Kaboré. We are looking at expanding this project to other areas around Koudougou. Our ambition is to develop solar irrigation in major cities in the country that lack a regular supply of vegetables." In the country, drip irrigation and solar pumping are not frequent in agriculture. The ambition, if achieved, would thus contribute to greater food autonomy.



Wood carrier in a small village near Koudougou
UNCDF / Touré Monia Roxane

NAFA NAANA
Pour des économies sûres !

NAFA NAANA

30% REDUCTION IN FUEL CONSUMPTION THANKS TO IMPROVED COOKING STOVES

6,000 IMPROVED COOKING STOVES SOLD DURING THE PROJECT

380 SOLAR LIGHTING DEVICES SOLD

NAFA NAANA INTENDS TO GENERALIZE ECOLOGICAL CLEAN COOKING

"I have been working in the restaurant business for about ten years. I can receive orders for several hundred guests, up to a thousand, for weddings, baptisms, funerals, and other religious ceremonies. I prepare local dishes such as gonré, yassa chicken, tô, fatty rice (...) Since I acquired these two improved stoves that can carry large cooking pots from the Nafa Naana company, I cook in much better conditions; they emit very little smoke. Economically its very advantageous because it allows me to reduce my wood consumption," says Monique Nana Samandoulougou, a restaurant owner and caterer in Ouagadougou.

With conventional fireplaces, for preparations intended for 300 people, this professional cook could spend CFA franc 25,000 to buy wood (around $40). Now, thanks to improved stoves, CFA franc 15,000 is enough. During important events, Monique Nana Samandoulougou calls on staff to help her. She is already planning to buy other improved stoves for her business. The price of an improved fireplace supporting large cooking pots, sold by Nafa Naana, a Burkinabe company specializing in the sale of clean cooking solutions, is around CFA franc 30,000.

Whether for professional or domestic use, improved stoves are more efficient and reduce fossil fuel consumption by around 30 percent compared to traditional stoves. The gain is economic, environmental and healthwise, with a reduction in CO2 emissions and inhaled toxic fumes. Like Monique Nana Samandoulougou, thousands of Burkinabe women have abandoned their traditional cooking stoves for improved cooking appliances designed by local artisans and sold by Nafa Naana. "For these families living in rural or peri-urban areas, in situations of severe energy poverty, the cost of these appliances is relatively affordable. This is a first step towards more ecological cooking systems, liquefied petroleum gas (LPG) or solar stoves," points out Linda Candide Somé, technical and quality control manager at Nafa Naana.

Established in 2010 and a pioneer in the clean cooking sector in Burkina Faso, this social enterprise was selected as part of the FERR-BF project, in order to accelerate the marketing for domestic and professional use, on a larger scale, of improved cooking stoves and other products powered by renewable energies, including solar lamps and kits; appliances essential to the economic development of populations who do not have access to electricity. Nafa Naana has also started the promotion and sale of solar-productive equipment, such as freezers and solar motorcycle pumps.

A grant of $120,000, as well as financial and technical support from UNCDF, enabled Nafa Naana to expand its footprint in the country while strengthening its sales team, with the opening, in 2019 and 2020, of additional agencies in five other cities in the country, including Dédougou, Banfora and Gaoua, complementing its network initially deployed in Ouagadougou, Bobo-Dioulasso and Dano. A sixth opening was planned in Fada N'Gourma but was postponed due to the deterioration of the security situation in some areas of the country. The company could not imagine being faced with such complicated areas of access. Between the COVID crisis, insecurity problems and rising transport costs, Nafa Naana has learned to adapt quickly, it is now present on social media to communicate with the largest number of beneficiaries.

During the project's implementation period, between 2019 and mid-2023, the company sold some 6,000 additional improved cookstoves and around 380 additional solar lighting devices, surpassing the goals set by FERR-BF (by 4,500 and 350 respectively). Until then, the company claimed to have sold more than 26,000 improved wood and coal fireplaces and marketed more than 12,100 solar products. In 2022, the company achieved a turnover of CFA franc 90 million (approximately $145,000). It currently has 17 employees.

IMPROVED STOVES
that display better efficiency and allow for a reduction in fossil fuel consumption of about 30% compared to traditional cooking stoves.

Maintaining an accessible retail price

Despite the sharp rise in the cost of raw materials and metal sheets used by artisans in 2021 and 2022, Nafa Naana managed to maintain the selling price of its cooking appliances for end users. "We are a social enterprise, certainly not too focused on margins and profits

However, without the support of the FERR-BF, in this period of inflation, we would not have been able to maintain our prices for end users.

"Artisanal producers of improved stoves have come together in associations to ask Nafa Naana to increase the purchase price of the finished product. Discussing the price of appliances with artisans, who survive one day after the other, exposed us to the risk of having poorer-quality cooking stoves. Nafa Naana, therefore, decided to buy the equipment at a higher price (...) One of the destabilizing risks for the entire chain is the price variability of raw material, which increases costs for artisans, ultimately impacting the final price of cooking appliances," explains Flaure Ilboudo Couroubio, renewable energy and clean cooking specialist at UNCDF Burkina Faso. In this context, Nafa Naana regrets that clean cooking stoves are not tax-free which would allow to reach more people throughout the country.

Microcredit agents who became renewable energy ambassadors

For the company, one of the project's challenges was investing in a new niche: solar equipment used for productive purposes, like agriculture, catering or sales activities, requiring motorcycle pumps and solar freezers. This is a new area of opportunity for activities generating incomes, which is necessary, as the living conditions harden in the country and the flow of displaced people into areas without electricity increases.

While the project has made it possible to test the demand and the equipment, the objectives have not yet been achieved. The reason is that the purchase costs of productive equipment are too high for potential entrepreneurs to bear. The price of a solar freezer is around CFA franc 500,000.

DURING THE PROJECT IMPLEMENTATION PERIOD
the company will have sold an additional 6,000 improved cooking stoves and about 380 more solar lighting devices, thus exceeding the targets set by FERR-BF of 4,500 and 350 respectively.

"Even if a business selling ice cream or juice is launched, a small entrepreneur cannot disburse such a sum right away. He will need microfinance," says Dominique Tamini, head of operations and commitments at Graine.

This microfinance institution, launched in 2006, began working with Nafa Naana as part of the FERR-BF project to promote access to and financing of solar productive equipment. With outstanding loans of nearly CFA franc 5 billion, a customer portfolio of 105,000 members (including 45,000 active accounts), a presence in 35 of Burkina Faso's 45 provinces and experience in collecting microcredit loans, Graine has been identified as one of the essential and most efficient partners to enable the uptake of renewable energy solutions. And ultimately provide financing solutions adapted to the constraints of the beneficiaries.

A partnership established with Nafa Naana, as well as with two other companies included in the FERR-BF cluster, AES and Oolu Solar, made it possible to train 113 of the 184 credit agents employed by the microfinance institution in solar and clean cooking products, who in turn became renewable energy ambassadors in the field. "Renewable energies were completely new for us. Now, it's part of our daily lives. When one of our agents leaves, he kills two birds with one stone and raises awareness about microfinance and solar solutions. We reached nearly a thousand people. The potential is big.

Awareness session on the use of improved stoves
UNCDF / Calex Brice Mone

People want access to renewable energies to reduce their costs. The need is there, in catering for clean cooking, in agriculture, because they need solar pumps for growing cassava, which requires a lot of water, and for solar lamps and refrigerators," explains enthusiastically Firmin Somda, in charge of green finance at Graine.

Nafa Naana: "Credit is not our job"

Graine already sees the opportunity to diversify its business portfolio, while meeting real and significant needs. But to transform the trial, the microfinance institution calls for establishing credit lines appropriate to the renewable energy sector or a guarantee fund to secure loans and support growing demand. The average credit the microfinance institution provides is currently CFA franc 150,000, with interest rates varying from 12 percent to 15 percent depending on the nature of the projects.

The issue of financing productive solar equipment is crucial. "We could not imagine that the uptake of these products would be blocked by lack of financing. We acquired the samples and started to communicate, but we realized that we had to use other less expensive products or turn to microfinance (...) In Ouagadougou, people are employed or have some sort of revenue. With their revenue, they can pay for equipment at CFA franc 10,000. But in rural and peri-urban areas, informality dominates. It is more difficult for people to pay for equipment in cash. Providing credit is not our field of activity. On the other hand, this is the job of microfinance institutions, which also know how to recover money," notes Linda Candide Somé, from Nafa Naana.

Demonstration of the use of an improved stove by Nafa Naana
© Nafa Naana

Installation of AES solar energy in the Re Kyi Wo Yi bakery
UNCDF / Touré Monia Roxane

AES

14 SMES OF WHICH 8 ARE LED BY WOMEN

70 KWP CAPACITY OF INSTALLED PHOTOVOLTAIC PANELS

150 TONNES OF CO2 AVOIDED

AES: SOLAR ENERGY, A DRIVER FOR AGRIBUSINESS

Bakery, poultry farm, fish factory, market gardeners, pharmaceutical manufacturing unit or even a hotel... For the fourteen micro-enterprises selected by Africa Energy Solaire (AES), as part of the FERR-BF, access to solar energy is a small revolution.

Thanks to this company specializing in the supply and installation of photovoltaic equipment, Valentine Kanyala's bakery, located in Réo, now equipped with a freezer and solar lamps, has thus seen its electricity bill drop drastically. It is nearly midnight, and it has been almost eight hours since twenty employees have been working to make bread. They will work all night, until the thirteen independent salesmen, including five women, take over in the early morning to deliver the loaves of bread. In a corner, ten bags of flour are piled up. The bakery makes between 4,000 and 6,000 loaves of bread per day, depending on the season.

At the back of the bakery, one of the employees breaks pieces of ice to incorporate it into the dough, which rises and undulates in the mixer tank. "The solar lamps supplied by AES allow us to keep the bakery illuminated at night, when there are power outages. This often happens with Sonabel. The solar freezer is for making ice, which is essential for making bread," explains Valentine Kanyala, the

Kanyala Valentine, Manager of the Re Kyi Wo Yi bakery
UNCDF / Touré Monia Roxane

14 BENEFICIARY COMPANIES
mainly family-run micro-enterprises, of which 8 are led by women.

Re Kyi Wo Yi Bakery, in Réo - Kneading bread dough with ice.
UNCDF / Touré Monia Roxane

owner of the bakery, widow and mother of two children. "Without solar energy, making ice costs an average of CFA franc 15,000 per day. And in hot weather, much ice is consumed. Before the solar freezer, you could end up with bills of CFA franc 350-450,000 per month! The installation of AES allows us to make very big savings", adds the company manager. Starting in November, the bakery intensifies its production; with the cold weather, people consume more bread. To acquire this freezer and the solar lamps from AES, for a total cost of CFA franc 10 million, Valentine Kanyala paid nearly CFA franc 6 million, paid in two instalments. The remaining CFA franc 4 million were subsidized by the FERR-BF.

The installation of photovoltaic solar panels sized for the productive sector, in particular agriculture, coupled with lithium batteries and pay-as-you-go (PAYGO) payment systems, has allowed beneficiary companies to significantly increase their turnover and suggests real growth prospects. Solar energy reduces the consumption of electricity from the network of the National Public Electricity Company in Burkina Faso (Sonabel), making it possible to organize against power cuts and reinvest the savings. As a result, it creates jobs and improves the living conditions of villagers.

Supported by UNCDF, AES has deployed its solutions in western and southwestern Burkina Faso, areas that are well-watered, conducive to agricultural development, and which, at the same time, lag behind in terms of renewable energies. Sola irrigation pumps, mills, crushers, refrigerators and solar incubators have been installed for farmers. The most significant project, with a capacity of 19 kW, was carried out on a farm in Banfora.

70 KILOWATTS-PEAK (KWP) INSTALLED
representing nearly 150 tonnes of CO_2 avoided per year.

The fourteen beneficiary enterprises, mainly family micro-enterprises, eight of which are run by women, were handpicked by AES and assisted by a consulting firm to ensure their solvency and their strong social impact. Among the criteria selected is the ability to reimburse the cost of acquiring productive solar equipment, which can reach several hundred thousand CFA franc and up to CFA franc 3 million, excluding grants, for example, for a solar energy and refrigeration kit. The grant provided by FERR-BF, worth a total of CFA franc 58.8 million (approximately $95,000), helped to reduce the bill for the beneficiary companies. In parallel, AES obtained a loan of CFA franc 168 million ($300,000) from the Least Developed Countries Investments Platform (LDCIP), a UNCDF product, repayable in 24 months, allowing it to scale up.

Over the period 2021-2022, AES recorded a turnover of nearly one billion CFA franc and grew by 15 percent per year over the past three years. The company claims more than 30 percent of the market share in the renewable energy sector in Burkina Faso. Since its inception in 2009, AES has been importing its solar equipment (photovoltaic panels, converters, pumps, charge controllers, freezers, lithium storage batteries, incubators, etc.) from regular suppliers, manufacturers of renewable energy products established all over the world, in Germany, France, the United Kingdom, Turkey, Slovenia, and China in particular.

Acquisition of productive equipment

"For each solar installation, the FERR-BF project subsidises the bill at 40 percent. At the end of the work, the customer must make an initial payment of 50 percent of the remaining cost and then pay the balance over the following twelve months, all with the PAYGO system. Once all payments are made, the equipment belongs to them. We then provide maintenance for three years (...) The majority of our beneficiaries manage to pay. This is less the case for companies in red zones that now have difficulty marketing their products due to insecurity, but it is a situation that is understandable," explains Achille Ziba, an engineer at AES. "It is a pilot project, adds André Bere, sales director and one of AES's partners. The aim is to get all those interested in solar products for productive use to turn to microfinance to finance their purchase on credit. A small business alone cannot disburse the initial amount required without a grant. However, our experience shows that thanks to the revenues generated by their productive activity, beneficiaries are able to pay monthly micro-credit payments."

Linked with the microfinance institution Graine, AES is considering establishing a partnership to meet demand. "Hundreds of solar pumps could be installed to promote agribusiness. People are waiting for just that! But this will not be possible without an appropriate financial mechanism, which would include grants, the use of microfinance and a guarantee fund. Traditional banks are not keeping up with the needs. Their rates are not adapted to the renewable energy and agricultural sectors, which are essentially seasonal", underlines André Bere. Because of its agility and its base of members and cooperatives, microfinance is favoured by the head of AES. AES solar awareness and training activities were conducted with Graine teams in Koudougou, Dédougou and Ouagadougou.

Develop new products

The FERR-BF project has strengthened AES's technical capacities and human resources. Three persons, including the engineer Achille Ziba, were recruited, bringing the total number of staff to 30. The project also created a dozen jobs for the beneficiaries. On the environmental level, the 70

kilowatts-peaks (kW) installed, thanks to all the photovoltaic installations, represent nearly 150 tons of CO2 avoided annually.

The project also gave AES other ideas: the company specializing in renewable energies intends to develop new products, such as an induction cooker, designed by its teams and then installed in a school canteen. She wants to introduce more digital technology to share information and wonders about introducing a microinsurance component to guarantee the collection of debts from customers likely to be affected by a deterioration in the security situation. "We did not anticipate that things would deteriorate to this point. Instability is certainly a risk. At the same time, people have become aware of the importance of their energy autonomy. Hence, there is a need to provide them with help where they are.

Renewable energies make it possible to be resilient, not only in the face of climate change but also in the face of political insecurity", indicates André Bere.

Changing regulatory frameworks

Resilience. The surplus of electricity produced by some of the high-capacity hybrid photovoltaic power plants installed by AES, i.e. more than 4,000 kWh, could, if institutional and regulatory obstacles were removed, not be lost and reinjected into the Sonabel network. This potential should be exploited while Burkina Faso seeks to significantly increase its capacity to meet economic challenges and the population's needs. To consume and eventually reinject excess solar electricity into the grid, businesses will need to be equipped with a two-way meter, a device that is currently not defined by regulations.

This highlights one of the necessary changes in regulatory frameworks for the production, distribution and marketing of electricity in Burkina Faso. An energy working group was thus set up in 2022 to consider the various challenges in the renewable energy market in the country, bringing together the Energy Sector Regulatory Authority (ARSE), the National Renewable Energy Agency (ANEREE), the Burkina Faso Rural Electrification Agency (ABER), Sonabel, and development partners including UNCDF.

LESSONS LEARNED AND RECOMMENDATIONS

At the end of the FERR-BF program, several lessons can be shared. First of all, the issue of the accessibility of clean energy solutions for the poorest populations highlights the need to jointly offer appropriate financing mechanisms, whether it be microfinance for end users or loans at affordable and secure rates for businesses, in this case through the activation of a guarantee fund.

UNCDF is thus working on a strategy for banks to support them and enable them to develop products adapted to the renewable energy sector. Commercial banks are still quite cautious. It emerged that they did not know the sector well. UNCDF has already met with Société Générale Burkina Faso, Ecobank, Crédit Agricole and Coris Bank, which are interested in mobilizing resources for project promoters in the renewable energy sector. The adoption of a national strategy for the financial inclusion of companies in the renewable energy sector, developed on the basis of their needs and the proposals of financial and banking institutions, will be the next challenge to improve business financing in Burkina Faso. Accessibility also involves the digitization of tools, including pay-as-you-go, allowing operators to recover their claims and final beneficiaries, novice micro-entrepreneurs, to manage their inflows and outflows of funds rigorously.

The use of leasing was mentioned by one of the ESCOs as a way of reducing the down payment to acquire productive solar equipment, but in view of the lack of financial education in rural areas in particular, this solution seems premature. Indeed, we must consider the reluctance linked to a lack of knowledge about this financial product and, perhaps, even more, the fear of being judged by the neighbourhood in the event of non-payment if a device of which the user is not the owner was to be uninstalled.

In this case, microinsurance could be part of the solution. This is a topic that is gaining ground and would make it possible to secure families whose rental contract for solar productive equipment is interrupted, due to hazards (death of the head and breadwinner of the family, poor harvest, worsening of the security situation preventing movement and the sale of products). A workshop on this theme was organized in June 2023 with ESCOs and other partners in the renewable energy ecosystem, who expressed their interest. "We need to encourage and mainstream innovative digital payment mechanisms for solar installations, such as PAYGO, and combine microinsurance to reassure businesses and ensure the system's sustainability. Thanks to these innovative mechanisms, we will be able to expand access to renewable energies", underlines ANEREE. On the ESCO side, there is still much to do and potential to exploit.

This concerns energy service companies identified by UNCDF that have not received grants, but technical assistance from the 2M Invest Consult, 2iE and BBI incubators. They could carry out their projects if they had access to funding while controlling their finances. The feedback from 2M Invest Consult, which has incubated 21 companies, provides interesting insights. For 16 of them, the role of the incubator was to support them until their projects and business plans were mature so that they could convince banks to finance them. "We prepared the business plans with these 16 companies, and when everything was ready, we organized a round table with 13 financial institutions, a kind of project exchange that saw the participation of ten banks and three MFIs. The banks did not reject the projects, they offered fairly standard rates in the range of eight to 11 percent. But was missing was the entrepreneurs' willingness to put their hands in their pockets. They would have had to contribute 20 to 30 percent of the funds to get a bank loan. In fact, the project leaders thought they would receive

a grant. There was a poor understanding of the project, but above all, a lack of financial education to accept risk-taking and for the bank to have control over their business management. However, the projects were bankable! A change in mentalities is needed", underlines Dieudonné Manirakiza, managing director of 2M Invest Consult.

The FERR-BF project has highlighted the impact and efficiency of energy solutions such as solar pumping and clean cooking, which should expand throughout Burkina Faso over the next five years. In agriculture, solar pumping on a larger scale would significantly increase the area cultivated by young people and women, diversify crops to adapt to climate change, strengthen food security and fight hunger. Regarding food and clean cooking, it is necessary to take into account (traditional) culinary habits and women's preferences (evolving needs) in terms of cooking equipment to identify technologies to be popularized in order to guarantee an energy transition (improved stoves, gas, etc.).

On the institutional side, the FERR-BF project has made it possible to strengthen capacities. Two new consultation frameworks have been established at the governmental level. A first framework for consultation between the participating actors in the renewable energy ecosystem is being set up, which is the subject of a ministerial decree. UNCDF has assisted in identifying and selecting all actors in this ecosystem. This framework, to which the Burkina Faso Rural Electrification Agency (ABER) has contributed in particular, is placed under the supervision of the Ministry of the Environment; it will make it possible to identify and bring together the various actors, to name the challenges and obstacles, to highlight the main themes in the sector to be discussed, to exchange on good practices and lessons learned, and to understand what everyone's interests are. This holistic framework involves all stakeholders, agencies, ministries, technical and financial partners, including the Ministry of Women, the Ministry of Agriculture, the Ministry of Economy, Finance and Foresight, etc.

A second multisectoral consultation framework on digital finance has been created with the Technical Secretariat for the Promotion of Financial Inclusion (ST-PIF). It mobilizes the Ministry of Economy and Finance, the Ministry of Energy and the Ministry of Digital Transition. Its objective is to promote digital technology for renewable energies, facilitating access to energy systems, payments and the acquisition of equipment. The collaboration between ST-PIF and UNCDF has enabled the integration of renewable energy issues into this digital finance framework. "This collaboration with UNCDF has contributed to the expansion of our missions so that we can consider green finance issues. New missions that were established by a ministerial order dated 27 March 2023 on the organization, powers and functioning of the Secretariat", underlines Lin Hien of the ST-PIF. The Burkinabe authorities have taken up the topics of green finance and digital finance, so it is necessary to support them.

About UNCDF

The United Nations Capital Development Fund (UNCDF) is the United Nations' flagship catalytic financing entity for the world's 46 least developed countries (LDCs). With its unique capital mandate and focus on the LDCs, UNCDF works to invest and catalyse capital to support these countries in achieving the sustainable growth and inclusiveness envisioned by the 2030 Agenda for Sustainable Development and the Doha Programme of Action for the least developed countries, 2022–2031.

UNCDF builds partnerships with other UN organizations, as well as private and public sector actors, to achieve greater impact in development, specifically by unlocking additional resources and strengthening financing mechanisms and systems contributing to transformation pathways, focusing on such development themes as green economy, digitalization, urbanization, inclusive economies, gender equality, and women's economic empowerment.

A hybrid development finance institution and development agency, UNCDF uses a combination of capital instruments (deployment, financial and business advisory and catalysation) and development instruments (technical assistance, capacity development, policy advice, advocacy, thought leadership, and market analysis and scoping), which are applied across five priority areas (inclusive digital economies, local transformative finance, women's economic empowerment, climate, energy, and biodiversity finance, and sustainable food systems finance).

Disclaimer

Left: Young sorghum sprout.
Top middle: Nursery of the Relwendé Cooperative.
Bottom middle: Transplanting onion shoots in the nursery of the Relwendé Cooperative.
Right: Member of the Nabonswende Cooperative.
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