



WATER-WISE

Smart Irrigation Strategies for Africa



Between 2003 and 2013, Benin witnessed a rapid increase in the uptake of irrigation. The share of arable land under irrigation increased by 80 percent during that period,¹ yet less than 1 percent of the country's arable land is currently equipped for irrigation. The 2018 Biennial Review Report by the African Union revealed that Benin is currently not on track to meet Malabo Commitment area #3.1, "Access to agriculture inputs and technologies," given its score of 4.23 out of 10, which falls below the 2017 minimum score of 5.53.² However, the potential to expand land under irrigation is high. **Large-scale irrigation systems can potentially be increased to 1.6 million hectares (ha), with an internal rate of return (IRR) of 6 percent, while small-scale irrigation systems can potentially be increased to 0.11 million ha, with an IRR of 8 percent.**³

INSTITUTIONAL INNOVATIONS

Benin has a Directorate of Hydro-Agricultural Management (DAH) within the General Directorate of Rural Development and Equipment (DGAER) of the Ministry of Agriculture. DAH outlines national policies and programs on agricultural water management, as well as their implementation and monitoring. A Laboratory for Approval and Control of Irrigation Equipment within DAH tests the technical aspects of irrigation equipment and monitors hydro-agricultural developments.⁴ In addition, in 1994, a dedicated unit, the Cellule Bas-fond, was set up within the Ministry of Agriculture to assist DAH in promoting the development of lowlands and small-scale irrigation schemes.

The government also established a network of Chambers of Agriculture of Benin - public institutions with legal status and fiscal autonomy in 2001 that represent those working in the agriculture sector to the public authorities. The network acts as a platform for dialogue and advocacy to participate in the development and implementation of public policies.^{5,6}

POLICY AND PROGRAMMATIC INTERVENTIONS

In the 1960s, Benin's irrigation policies and programs focused on the development of large hydro-agricultural systems managed by public companies and development partners. However, between 1977 and 1980, the hydro-agricultural management programs proved to be unsustainable, largely due to governance challenges that led to their discontinuation. As a result, throughout the 1980s, the government prioritized the expansion of small-scale irrigation systems, particularly in the lowlands. In 1998, Integrated Water Resources Management was adopted, aimed at promoting small and inexpensive irrigation systems, which were easily replicable by farmers. In addition, private irrigation systems for large formal agricultural enterprises and farmers' groups were promoted.⁷

In 2001, a public-private partnership - the National Program for the Promotion of Small Private Irrigation - was formed with the ambition to bring 12,000 ha of land under irrigation. The private sector financed 54 percent of the program while the government covered the remaining 46 percent. The program

led to the establishment of a national agency for private irrigation development, and a consultation framework to promote irrigation in the private sector. By developing and rehabilitating small irrigated plots, the program then transferred their management to the private sector, thus encouraging small-scale farmers to take up modern irrigation technologies on their plots. The program also strengthened the technical capacities of farmers and farmers' associations as well as that of technicians and distributors of irrigation equipment.^{8,9}

Between 2007 and 2012, a program to improve the livelihoods of vulnerable populations through irrigation interventions was implemented in two departments - Atacora-Donga and Mono-Couffo. The Hydro-Agricultural Development Program - PROTOS - developed 120 production areas in Mono-Couffo and 40 production areas in Atacora-Donga, allowing rice production in the rainy season and market gardening during the dry season using irrigation. The program was managed by Regional Producers Unions, which negotiated with and contracted service providers. About 47 percent of beneficiaries were women engaged in rice production or market gardening. Furthermore, the program created an atlas for irrigation potential in the lowlands of Atacora-Donga and Mono-Couffo using a GIS system; more than 35,000 ha were identified. The atlas helped decision-making on the spatial development of the rice and horticulture sectors in Atacora-Donga and Mono-Couffo.¹⁰

As part of the Strategic Plan for the Revival of the Agricultural Sector (PSRSA), several programs related to irrigation were designed and implemented between 2010 and 2015. These programs aimed to train nearly 3,000 young people on irrigation practices and developed 12,000 ha in the lower and middle valley of Ouémé. The programs also sought to promote the development of farmer-led irrigation

by including farmers in the planning, rehabilitating their land, and then transferring its management back to them.¹¹

Using new irrigation technologies, such as solar-powered drip irrigation, provided substantial economic, nutritional, and environmental benefits. An evaluation of a project in northern Benin showed that due to the use of solar-powered irrigation systems, beneficiaries produced an average of up to 2 tons of tomatoes, okra, peppers, eggplants, carrots, and other green vegetables per month. The increase in production also allowed beneficiary groups to keep an average of 18 percent of their harvest for home consumption and to sell the surplus at local markets. The additional income earned from sales was used to increase purchases of staples and protein during the dry season, and oil during the rainy season. In beneficiaries' villages, vegetable consumption reached up to 5 servings of vegetables per day (the USDA Recommended Daily Allowance for vegetables), mainly during the dry season, compared to the average of just one serving of vegetables per day across all villages.¹²

The institutional and programmatic innovations of the past years are contributing to irrigation uptake across Benin. The government recognizes the importance of collaborative efforts with the private sector to sustainably increase irrigation uptake. Irrigation investment has been largely geared toward the promotion and development of private and small irrigation systems. However, a large part of Benin's irrigation potential remains unexploited. Tapping into this potential may increase agricultural production and further improve livelihoods and resilience in rural areas. Moreover, access to irrigation technologies based on renewable energy needs to be actively facilitated and promoted.

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