

Angola's Water Wealth: Unveiling its River Systems Strong Potential for Sustainable Development

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ARTICLE INFORMATION	ABSTRACT
Article history: Published: October 2026 Keywords: Water resources Hydroelectric potential Irrigated agriculture potential Sustainable development	Angola's huge water resources are still completely unexplored given its strategic importance value for sustainable development. This research takes a look at the country great hydroelectric potential and irrigated agriculture. Cuanza, Cunene, Catumbela, Longa, and Queve river basins constitute majority of Angolas's technical hydroelectric potential approximately 18 GW, around 100 sites for mini and small hydropower schemes and 159 sites for large-scale hydropower plants had been identified. Major plants such Capanda, Laúca (about 2,070 MW), Cambambe are currently in operation, but still a large portion of their potential remains unexplored. Angola has a tremendous irrigation potential in its agriculture sector with approximately 7.4 million hectares of land with high irrigation capacity and approximately 5.9 million hectares are categorized as moderate to high capacity. The recent government statements indicated a possible potential of up to 17 million hectares with plans of expanding irrigable areas to about 5.9 million hectares. The present research suggested that the integration of irrigation and hydropower could contribute to promote agricultural productivity, improve energy security, support food security, and boost regional development. Organized policy action, long-term investigates, and better water management are all essential for achieving its potential. Angola's water resources can play a major role in promoting fair and stable economic development, with the right regulations.

1. Introduction

It is worth noting that, since the beginning, water has always been fundamental to the development of societies, being directly linked to the health and well-being of people. The issue of water distribution in the world continues to be a prominent problem, as there are a large number of people in various regions without access to water, and this problem is becoming increasingly frequent, as population growth, climate change, as well as the growth in the pattern of habitual water consumption have accentuated the unavailability of this precious resource (Gabriel 2021). One of the biggest and most urgent problems facing Angola is the issue of water scarcity for a large part of the population. It is estimated that in rural areas only 32% of families have sources of drinking water and only 11% have adequate sanitation facilities (UNICEF 2018). What makes the case of water in Angola interesting and perhaps paradigmatic, from a methodological point of view, is the fact that the country has a privileged situation in terms of water resources in the regional context and, despite this relative abundance, does not ensure the basic needs of the population (Pereira 2011).

Angola is widely known for its oil wealth, yet one of its most strategic and under-utilized natural assets are water. Angola is a source of many major rivers in southern Africa and is referred to as the "water tower" of the region (Lourenco and Woodborne 2023). The country possesses an extensive network of rivers, high average rainfall in large parts of its territory, and significant untapped potential for hydropower and irrigation. These river systems originate from the interior Bié Plateau of the Angola Highlands and arise on either side of undulating watersheds that define large river catchments such as the Cuanza, Cassai (Congo), Lungui-Bungu (Zambezi), Cunene, Cuito and Cubango. Angola has the natural endowment to strengthen energy security, boost agricultural production, and support economic diversification but it turns out that the country explores only 5% of the power of its waters. This research is to demonstrate Angola strong and still largely under-used water resources and to argue that developing these resources (especially hydropower and irrigation) can help the country achieve: greater energy security, better food production and agricultural growth, economic diversification away from oil, and more sustainable and climate- resilient development.

2. Study Area

Angola is a large country of 1,246,700 km² on the southwest coast of Africa. The key features of the country's diverse geomorphological, geological, pedagogical, climatic and biotic characteristics are presented. These range from the ultra-desert of the Namibe, through arid savannas of the coastal plains to a biologically diverse transition up the steep western Angolan Escarpment. Congolian rainforests are found in Cabinda and along the northern border with the Democratic Republic of Congo, with outliers penetrating southwards along the Angolan Escarpment, or up the tributaries of the Congo Basin (Huntley 2019). Angola has 47 main hydrographic basins and receives a long-term average annual precipitation of approximately 1,010–1,060 mm. Rainfall is concentrated between November and March and is highest in the northeast (around 1,400 mm), while the coastal and southern regions are much drier (often below 500 mm). Internal renewable water resources are estimated at about 148 km³ per year (AQUASTAT 2022). Major river systems such as the Cuanza (Kwanza), Longa, Queve, Catumbela and Cunene hold the greatest concentrations of both flow and

elevation drop, making them especially valuable for power generation and large-scale water management. Angola also functions as a regional “water tower,” particularly through the Angolan Highlands that feed the Okavango, Congo and Zambezi systems.

3. Water Resources Potential and Development

3.1 Hydroelectric Potential

The lack of energy in a society accentuates the existence of social asymmetries in living conditions and quality of life, such as: the persistence of poverty, the lack of opportunities for growth, the migratory flow to large cities, and the disbelief of that society in the face of its future. It is believed that, with the arrival of electricity, rural communities can acquire a greater degree of economic and energy sustainability (Pereira, 2011). If there are sectors in which Angola feels the weight of structures that need to be modernized, electricity production is one of them. Although the current model, traditionally supported by large power generation plants, has fulfilled its role, there is no longer any way to escape the evidence that points to the need to create alternative forms of production that must involve renewable energies. In Angola, energy is fundamental to the reconstruction of the country, because it is an essential element in the economic development and social progress of the country, a factor in promoting economic activity and human well-being (Sandandji 2014).

Studies conducted for the Angola Energy 2025 strategy identify a technical hydropower potential of approximately 18 GW, with the largest share concentrated in the Cuanza, Longa, Queve, Catumbela and Cunene basins (Borges 2023, Energy n.d). The government official made it known that in the energy sector, Angola has already achieved an electrification rate of around 48 percent, stressing that the goal is to exceed 50 percent by 2027 (Carlos 2026). Existing plants such as Laúca (over 2,000 MW), Capanda and Cambambe already demonstrate the viability of large schemes, yet a substantial portion of the total potential remains undeveloped. In addition, around 100 sites for small and mini-hydro plants (totalling roughly 600 MW) have been identified, offering cost-effective options for rural electrification and isolated mini-grids. Realizing a larger share of this potential would provide clean, relatively low-cost electricity, reduce reliance on fossil fuels, and create opportunities for industrial growth and possible green-hydrogen development.

Comprehensive hydrological assessments identified 159 sites suitable for large-scale hydropower plants. Of these, 20 were selected as priority projects for the future national electricity grid. In addition, around 100 sites for small and mini-hydropower plants were studied, offering a combined potential of approximately 600–607 MW ((Energy n.d). These smaller schemes are particularly useful for rural electrification and isolated mini-grids. Despite this high potential, only a relatively small portion has been developed so far. The largest operating plant is Laúca on the Cuanza River, with an installed capacity of about 2,070 MW. Other important plants include Capanda (520 MW) and the expanded Cambambe complex. Thousands of megawatts of potential are assumed to be retained in the middle of Kwanza corridor itself (Borges 2023).

Prominent projects planned and underdevelopment consist of more efforts on the Queve River (such as Cafula and Balalunga), initiatives on Cunene and Catumbela rivers, and Caculo Cabaça (about 2,172 MW), with the binational Baynes project with Namibia (Carlos 2026, Energy n.d). Following the conclusions of these initiatives, hydropower will remain the primary component to Angola’s electricity generation assets and supporting the country’s aim of expanding energy access and minimize its dependency on fossil fuels such as oil, natural gas and coal.

3.2 Agriculture and irrigation development

Angola’s river basins and fertile plateaus offer considerable scope for expanding irrigated agriculture. Official assessments point to several million hectares of land with high or moderate irrigation suitability (commonly cited figures range from 5.9 to 7.4 million hectares of good aptitude, with some statements referring to even higher theoretical potential). At present, the area actually equipped for irrigation remains very small—around 85,000 hectares according to recent FAO data (AQUASTAT 2022). Expanding well-managed irrigation schemes could raise food production, improve rural livelihoods, reduce import dependence, and help stabilize communities in drought-prone southern provinces.

Angola has a tremendous irrigation potential in its agriculture sector. According to the National Irrigation Master Plan, the country has approximately 7.4 million hectares of land with high irrigation potential. Of this total, about 5.9 million hectares are classified as high or moderate suitability (PLANIRRIGA n.d). In December 2025, the Minister of Agriculture and Forests, Isaac dos Anjos, announced that Angola’s hydrographic basins have the potential to irrigate up to 17 million hectares. He noted that, with proper utilization of available areas, it would be possible to reach 3 million hectares under irrigation. The government has also set a target of making approximately 5 million hectares irrigable through improved water availability and pumping systems.

Regarding this significant potential, the region currently designed for irrigation remains quite limited. Enhancing irrigation can markedly increase agricultural productivity, generate rural employment prospect, strengthen food security and diminish dependence on rain-dependent agriculture, especially in areas affected or experiencing inconsistent rainfall.

4. Challenges and Constraints

Despite the abundance of water at national level, resources are unevenly distributed. The south and some coastal areas face recurrent scarcity and have experienced severe droughts in recent years. Seasonal and inter-annual variability is high, and climate projections suggest possible further drying and longer dry seasons in southern basins. Infrastructure gaps, incomplete hydrological monitoring networks, limited storage in some catchments, and still-insufficient access to safe drinking water (basic access around 57 % nationally) constrain development. Transboundary river systems require careful cooperation with neighboring countries and extensive initiatives must critically address environmental and socioeconomic impacts.

5. Conclusions

Angola’s water resources serve as an effective tool for sustainable development when controlled wisely. Priority actions include the completion and optimization of major hydropower projects under construction or planned, scaling up of small and mini-hydro schemes, rehabilitation and expansion of irrigation infrastructure, investment in water storage and monitoring systems, and

strengthening of basin-level institutions. Integrated water-resources management must juggle the demands of energy, agriculture, domestic supply and ecosystems. Climate-resilient planning and better governance will be crucial to transform the country's huge water potential into sustainable economic and social benefits. Angola possesses one of the largest water endowments in Southern Africa. Hydropower resources are a strategic national asset for Angola. A larger share of the 18 GW potential would deliver clean, relatively low-cost electricity, support industrial development and contribute to long-term energy security. Angola's land and water resources offer strong opportunities for the development of irrigated agriculture, provided that priority is given to infrastructure, water management and investment. Targeted investment, good policy and careful responsibility for the environment can harness this natural advantage for cleaner energy, greater food security and wider prosperity for generations to come.

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