This study examines whether liquidity management enhances or constrains the operational efficiency of Islamic banks operating in SSA, where Sharīʿah-compliant financial infrastructure remains underdeveloped. Using panel data from 35 fully fledged Islamic banks over the period 2010–2024, the study employs a bias-corrected two-stage Data Envelopment Analysis (DEA) framework with Simar–Wilson bootstrap procedures, followed by fixed-effects regression to ensure consistent inference. The findings reveal that, despite maintaining relatively high liquidity buffers, Islamic banks in SSA operate significantly below the efficiency frontier, with average bias-corrected efficiency levels of 31.8%. Contrary to conventional banking theory, liquidity exhibits only a weak and marginal relationship with efficiency. This result reflects structural features of SSA Islamic financial systems, including shallow sukuk markets, limited Islamic interbank activity, and the absence of effective Sharīʿah-compliant lender-of-last-resort facilities, which collectively constrain the productive deployment of liquidity. By conceptualising liquidity as a binding monetary constraint rather than a discretionary management tool, this study offers a novel contribution to Islamic banking and monetary economics, particularly in the context of institutionally incomplete markets. The results further show that asset quality and institutional maturity play a more decisive role in shaping efficiency outcomes once liquidity constraints bind. The findings highlight that improving efficiency in SSA Islamic banking systems requires system-level reforms, underscoring the need for Islamic monetary authorities to prioritise the development of Sharīʿah-compliant liquidity infrastructure, including active sukuk markets, Islamic interbank facilities, and credible lender-of-last-resort mechanisms.