



48 Governments 1 Nation



Kirinyaga Saves Millions: Kerugoya County Referral Hospital Oxygen Plant Guarantees Lifesaving Care

County:	Kirinyaga County		
Sector/s:	Health	Sub-sector/Theme:	Health Systems Strengthening
Keywords: (for search on the online platform)	Kirinyaga Oxygen Plant, Kerugoya County Referral Hospital, Medical Oxygen Supply, Health systems strengthening; Health Infrastructure; Critical Care, Cost Savings, Value for money, emergency preparedness, inter-county learning, best practice, Maarifa Centre		
Target Audience:	County Governments, National and County Health Policymakers, Health Facility Managers, Development Partners, general population		
Authors (contacts and their institutions can be included as well)	<ul style="list-style-type: none"> • Dr. Esbon Gakuo - Director Medical Services, Kirinyaga County; directorhealth@kirinyaga.go.ke • Mercy Gatabi - Council of Governors, Maarifa Centre 		
Resource Persons (include their designations)	<ul style="list-style-type: none"> • Annette Evuusa – Hospital Manager, Kerugoya County Referral Hospital; evuusah7@gmail.com • Lisbeth Murimi – Biomedical Engineer, Kerugoya County Referral Hospital; lisbethwawira@gmail.com • Angela Wangeci - Communication Advisor & Knowledge Management Champion, County Government of Kirinyaga 		

Introduction

Kirinyaga County previously spent millions of shillings annually on outsourced oxygen cylinders for Kerugoya County Referral Hospital, yet frequent stock-outs and supply interruptions were common. This costly and unreliable system not only threatened the quality of emergency, surgical, and neonatal care but also placed sustained pressure on the County health budget, limiting resources for other critical priorities.

Patients requiring oxygen therapy, particularly critically ill adults, neonates, and surgical cases, were most affected, while health workers were constrained in delivering timely and effective care. Amref Health Africa (2025) reports that, nationally, only a small proportion of facilities have on-site oxygen generation, forcing many counties to depend on costly and inconsistently available cylinder deliveries, especially outside major urban centers.

During health crises, cylinder refill prices have historically tripled, rising from KES 2,500 to over KES 6,000 (Breaking Kenya News, 2021). In public referral hospitals, a patient on low-flow oxygen may require 2–3 cylinders per day (KES 5,000–18,000), while high-flow cases can cost KES 10,000–30,000 daily. Even one hour of therapy can cost KES 200–500, illustrating the financial burden for both patients and the County health system.

These challenges highlight the urgent need for sustainable, self-reliant oxygen solutions at the County level, underscoring the need for the intervention at Kerugoya County Referral Hospital.

Implementation of the practice:

To address these challenges, in 2023 the County Government of Kirinyaga invested in the installation of a medical oxygen generation plant at Kerugoya County Referral Hospital.

The County provided policy direction, financing, and overall oversight. The intervention aimed to achieve self-sufficiency in medical-grade oxygen while strengthening critical care capacity at the County Referral Hospital and other public health facilities across Kirinyaga County.



Figure 1 A biomedical technician shows Governor H.E. Anne Waiguru, EGH, how the oxygen plant operates during its unveiling.



As end users, Kerugoya County Referral Hospital developed the requisition proposal that initiated the procurement process for the oxygen plant.

Key activities undertaken for the oxygen project included:

1. **Feasibility studies for plant installation:** The feasibility studies were contracted to a specialized firm. Respondents included hospital staff, County Health Management Team members, supply chain and procurement officers, County finance officers, and patient and community representatives.
2. **Procurement of oxygen generation equipment:** An open tender was floated, and MedQuip Limited, with a proven track record in oxygen plant installations including participation in the AMREF Oxygen infrastructure project, was awarded the contract.
3. **Installation of compressors, dryers, and molecular sieve systems**
4. **Integration with the hospital's piped medical gas infrastructure**
5. **Capacity building for biomedical and technical staff:** Training covered plant operation, preventive maintenance, and safety protocols.

The contract was awarded in March 2021 and was initially scheduled for completion within one year. However, installation and commissioning were delayed by COVID-19 disruptions and importation challenges, extending the timeline to approximately two years, with the plant completed in April 2023.



Figure 2A fully operational medical oxygen generation plant at Kerugoya County Referral Hospital

The oxygen plant now serves as the primary source of medical oxygen for the County Referral Hospital and over 70 other public hospitals in Kirinyaga County.

Roles and Responsibilities:

- **Kerugoya County Referral Hospital Management:** Oversaw day-to-day coordination and integrated the oxygen plant into hospital services.
- **Biomedical Engineering Unit:** Managed technical installation, operation, preventive maintenance, and troubleshooting.
- **Healthcare workers:** Acted as end-users, ensuring rational and appropriate clinical use of oxygen across all service delivery points.

The intervention required an upfront capital investment of approximately KES 80 million for equipment procurement and installation. The project cost, spread over three financial years (FY 2020/2021–FY 2022/2023), also included allocation of human resources for technical operation and maintenance. These initial investments were offset by the elimination of recurrent expenditures previously incurred through outsourced oxygen cylinder supply.

To sustain the practice, Kirinyaga County has institutionalized routine preventive maintenance, ongoing capacity building for biomedical staff, and budgetary provision for spare parts and servicing. Additionally, plans are underway to install a 6,000-litre liquid oxygen storage tank to provide backup during maintenance or power interruptions, ensuring round-the-clock availability of oxygen and continuity of services.

Results of the practice



Figure 3 On-site medical oxygen being used in the neonatal incubation section, supporting the survival and care of critically ill young babies.

➤ **Reliable oxygen supply:** Uninterrupted, 24-hour availability of medical-grade oxygen across all critical service points, including operating theatres, inpatient wards, casualty, and neonatal units. The facility produces up to 10,000 litres per day, generating millions of litres of lifesaving oxygen since commissioning.

➤ **Near-elimination of stock-outs:** The plant has drastically reduced oxygen shortages, ensuring patients receive timely treatment and enhancing overall clinical responsiveness.

➤ **Enhanced patient safety:** Continuous oxygen supply has improved outcomes for critically ill adults, neonates, and surgical patients.



- **Financial savings:** Annual savings of approximately KES 20 million have been achieved, translating to cumulative savings of over KES 80 million over four years. According to the County Budget documents for FY 2021/2022 and preceding financial years, the County previously budgeted approximately KES 15 million annually for medical oxygen under the health budget. Even with this allocation, actual expenditure consistently surpassed the budgeted amount, leading to perennial pending bills. These resources have allowed the County to reinvest in other critical health priorities, including procurement of medicines, recruitment of essential health professionals, and infrastructure improvements.
- **Improved operational efficiency:**
 - Integration with piped gas systems has enhanced safety and streamlined oxygen delivery.
 - Capacity building of biomedical and technical staff has reduced equipment downtime and extended the lifespan of the plant.

What Worked Well:

- Strong political and administrative leadership, combined with in-house biomedical expertise, enabled timely decisions, efficient resource allocation, and effective technical guidance throughout the project.
- Clear alignment with critical care priorities ensured the intervention directly addressed urgent patient and health system needs.
- The strategic shift from “buying air” to “making air” strengthened local capacity and reduced reliance on external suppliers, positioning Kirinyaga County as a leader in health system self-reliance.
- Beyond cost savings, the intervention reinforced health system sovereignty by giving the County direct control over a critical lifesaving resource, ensuring continuous access for patients.

Challenges Faced

- Power instability and delays in spare parts procurement initially affected operations, highlighting the importance of robust contingency planning.
- Maintenance gaps required emergency interventions, demonstrating the need for strengthened preventive systems and rapid-response mechanisms.

Scaling Up and Replication

- Integrating high-capacity backup oxygen storage and reliable power solutions from the outset will reduce risks of downtime and service disruption.



- The model of in-house oxygen production, technical capacity building, and phased implementation provides a replicable blueprint for other Counties seeking sustainability, cost savings, and uninterrupted access to lifesaving oxygen.

Recommendations

- Counties should consider investing in local oxygen production as a high-impact, cost-effective measure to strengthen critical care, emergency readiness, and universal health coverage.
- Developing in-house biomedical and technical expertise ensures sustainability, reduces reliance on external suppliers, and enhances operational efficiency.
- Projects should plan for preventive maintenance, power backup, and human resource allocation at inception to prevent service disruptions and extend equipment lifespan.
- Counties should minimize over-reliance on outsourced oxygen or other lifesaving commodities to ensure consistent availability and avoid budgetary strain.
- The Kirinyaga approach of phased implementation, technical capacity building, and self-reliant infrastructure provides a blueprint for other Counties facing similar challenges.

Further reading:

1. **Kirinyaga County Government.** (2026, January). *Kirinyaga saves millions as Kerugoya oxygen plant guarantees lifesaving care.* kirinyaga.go.ke
2. **Mwangi, J.** (2026, January 30). *Lifesaving oxygen plant saves Kirinyaga Sh80m in four years.* The Star. www.the-star.co.ke
3. **Citizen Digital.** (2026, January). *Kirinyaga County saving millions as Kerugoya Hospital oxygen plant improves patient care.* www.citizen.digital
4. Amref Health Africa. (2025, May 20). *Kenya launches roadmap to strengthen oxygen access* [Press release]. <https://newsroom.amref.org/press-releases/2025/05/kenya-launches-roadmap-to-strengthen-oxygen-access/>
5. Breaking Kenya News. (2021, August 19). *Why Kenyans are paying more for oxygen.* <https://www.breakingkenyanews.com/2021/08/19/why-kenyans-are-paying-more-for-oxygen/>
6. PATH. (2025, May 21). *Ensuring access to lifesaving medical oxygen: Kenya's new policy roadmap.* www.path.org



48 Governments 1 Nation

Photo Gallery





48 Governments 1 Nation

