



GGOS Africa Workshop 2026

Building the Foundation for Geodetic Excellence in Africa



GGOS-Africa
Global Geodetic Observing
System - Africa



Presentation on

Public-Private Partnership in the Establishment of Continuous Operating Reference Stations (CORS) Network in Ghana

By

Associate Professor Y. Y. Ziggah

**Head, Geomatic Engineering Department
Vice Dean, UMaT School of Postgraduate Studies**

GGOS Africa Workshop 2026

Dates: 5th – 7th October 2026 | Venue: Ole-Sereni, Nairobi, Kenya

October 6, 2026



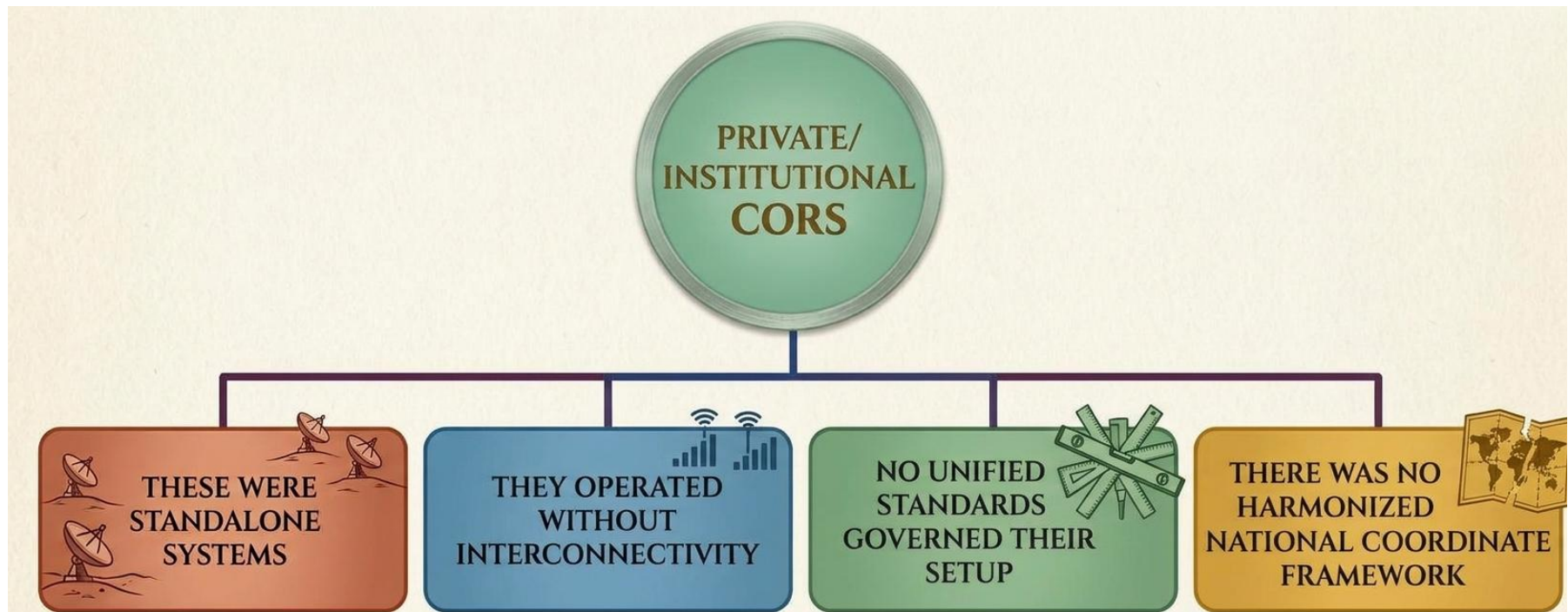
The Foundation for Geospatial Infrastructure

- ❑ Ghana historically relied on a passive network of ground monuments that had become sparse, unreliable, and difficult to access due to aging coordinates and lost control points, while private and institutional CORS installations created a fragmented landscape.
- ❑ Early five standalone CORS established under the Land Administration Project (LAPI & LAP II) were not networked, lacked centralised data management, internet connectivity issues and inadequate geographic coverage.



The Foundation for Geospatial Infrastructure

- ❑ Despite LAP's recommendation for nationwide CORS expansion, funding constraints halted further progress at the end of the project.
- ❑ This led to the growth of private and institutional established CORS to address operational needs.



The Ghanaian Case Study: Anatomy of the Partnership

Key Stakeholders:

- ❑ **Public Stewards:** Lands Commission (Survey & Mapping Division) for standards, quality control, and adoption.
- ❑ **Private Partners:** GMX Systems Ghana (technical lead, investment, risk-bearing) and Geo-Tech Systems (local expertise).
- ❑ **Silent/Strategic Partner:** Ghana Water Company Limited (GWCL) hosting stations at their facilities to reduce costs.
- ❑ **The Deal:** The 20-year MoU, the self-financing model ($\approx \$1.5\text{M}$), and the revenue-sharing expectation.
- ❑ *Geo-Tech and GMX chose to self-finance the project owing to the high cost of bank loans at the time of inception.*

Governance, Policy, and Enabling Environment

- ❑ **Legal Framework:** The legal underpinning comes from Ghana's Public Private Partnership Act, 2020 (Act 1039), which established the PPP Committee to approve and regulate such arrangements.
- ❑ **Stewardship vs. Operations:** The Lands Commission retains regulatory/quality control authority (stewardship) while the private partners handle day-to-day operations.

Operational & Technical Model

Network Scale & Coverage

- ❑ The network currently has 52 CORS stations deployed nationwide, zoned into southern, middle belt, and upper sectors.
- ❑ Coverage radius is approximately 70 km per station, allowing for about 90% coverage of Ghana.
- ❑ The long-term target is 100 stations for full national coverage.

Operational & Technical Model

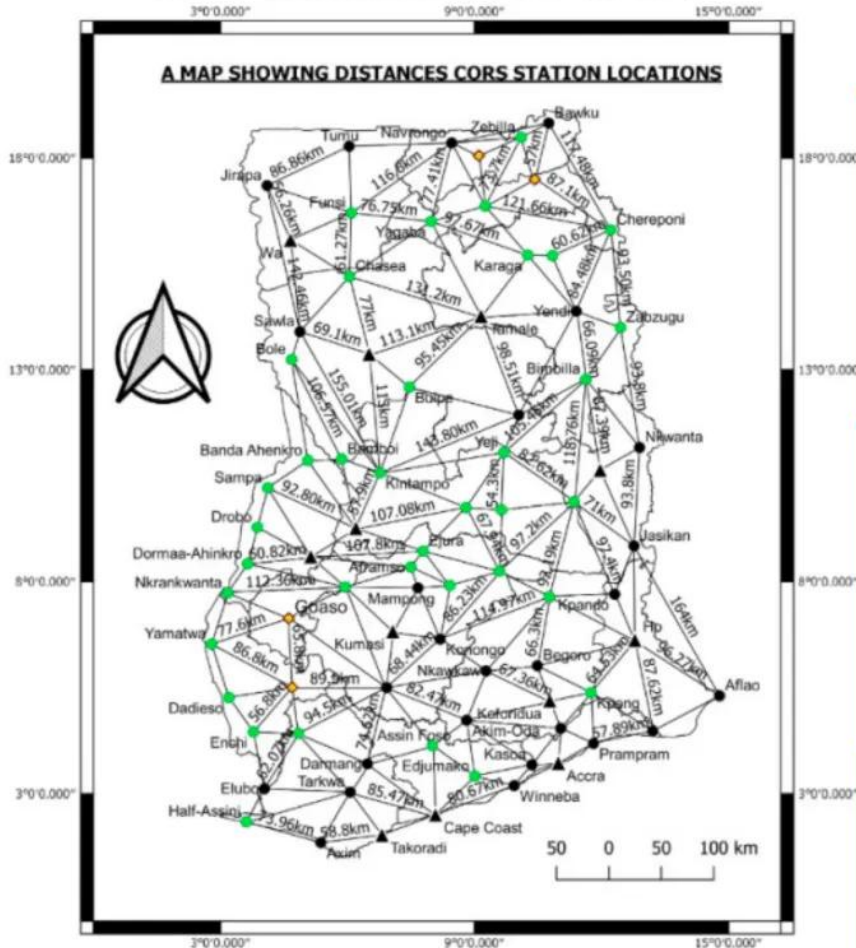
Technical Architecture

- ❑ GMX hosts the CORS network software on its virtual platform.
- ❑ Both Geo-Tech and GMX provide maintenance and technical support associated with running the CORS Network.

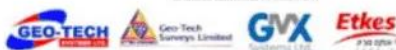
Operational & Technical Model

GHANA NATIONWIDE GNSS CORS STATION NETWORK

A MAP SHOWING DISTANCES CORS STATION LOCATIONS



PROMOTED BY



PARTNERED BY

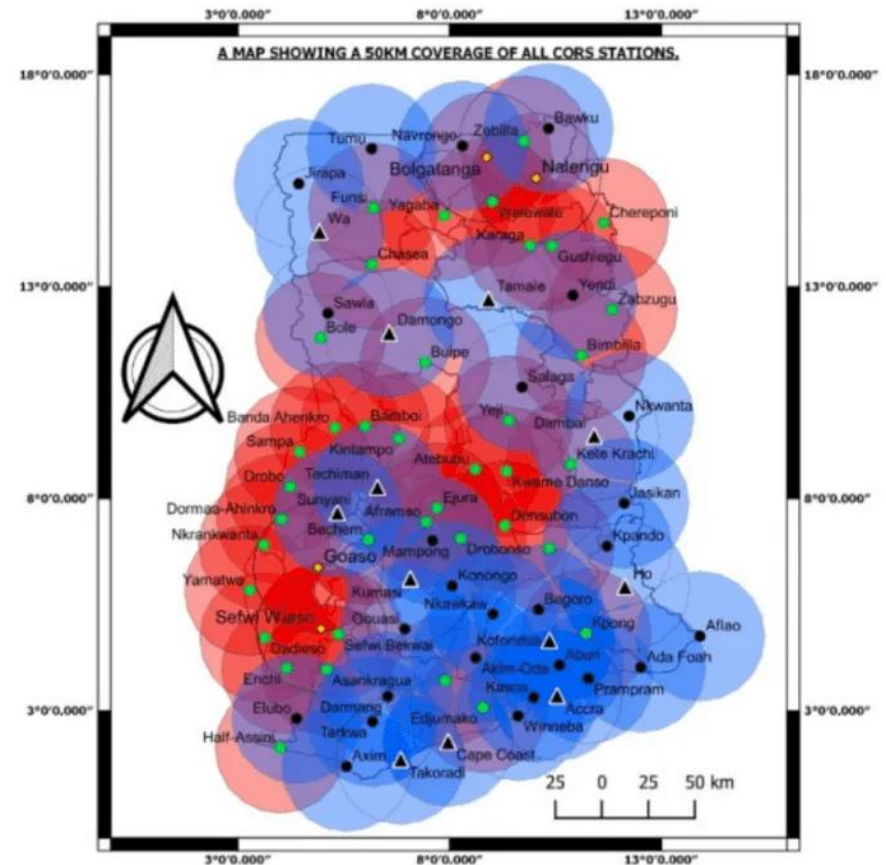


LEGEND

- Installed Locations
- Newly Proposed Locations
- ▲ Regional Capital With CORS Stations
- ◆ Regional Capitals without CORS Stations
- Distance In Kilometers 28th Feb
- New Regional Map of Ghana

GHANA NATIONWIDE GNSS CORS STATION NETWORK

A MAP SHOWING A 50KM COVERAGE OF ALL CORS STATIONS.



PROMOTED BY



PARTNERED BY



Lands Commission
Survey and Mapping

LEGEND

- Installed Locations
- Newly Proposed Locations
- ▲ Regional Capital With CORS Stations
- ◆ Regional Capitals without CORS Stations
- Coverage Of Installed CORS Stations
- Coverage Of Proposed CORS Locations
- New Regional Map of Ghana

Expected Revenue-sharing

**Revenue Share Options - through data/information/
toll etc. Sales – provided to the private sector for a fee**

**Public sector to
pay**

**Private sector to
pay**

**Freely available
data/information**

Public sector use Lands Commission			✓
Public sector use Other government agencies (Water Commission, a silent partner that provided sites for GPS sensor placement)	✓ ?		✓ ?
Private sector use Contractors with Lands Commission			✓
Private sector use Contractors with other government agencies		✓ ?	✓ ?
Private sector use All others such as construction, surveyors, developers, etc.		✓	

Source: Africa Geospatial Public-Private Partnerships: Business and Financial Considerations Report by World Geospatial Industry Council

Lessons Learned and Strategic Recommendations

- ❑ **Championing:** The project succeeded due to high-level political championing (the Vice President's support), Ghana's existing PPP policy framework, and prior working relationships between partners on smaller projects.
- ❑ **Recommendations:** Emphasize the need for clear governance mandates before partnership design, and the importance of viewing CORS as shared national infrastructure rather than a one-off tech project.

Conclusion

- ❑ Partnerships alone do not fix weak institutions.
- ❑ Ghana had a relatively mature PPP legal framework and institutional history that enabled the current model to work and not the partnership creating those conditions from scratch.

THANK YOU