ASEF

ASEF @ TechConnect '23

The Backbone of Africa's Internet:
Subsea Fiber Optic Cables

December 2023

ASEF @ TechConnect - Agenda [60mins]

1. Speaker Intro: Nomsa Mwayenga, Lord Osei-Ofori   [5 mins]
2. GARNET speech   [5 mins]
3. Introducing ASEF - purpose and objectives   [10 mins]
4. Subsea video on Fiber Optic Cable deployment   [3 mins]
5. Overview: Subsea Cables Deployed in Africa   [1 min]
6. Subsea Cables Ecosystem and impact on the Internet [3 mins]
7. Challenges and Gaps, Industry Efforts   [3 mins]
8. **INTERACTIVE TEAM SESSION**   [10 mins]
9. Team Present Solutions + What Actually Happened   [5 mins]
10. Q & A (as time permits)

Today's Speakers

Nomsa Muswai Mwayenga

Network Engineer, Meta Network Investments EMEA

ASEF Co-Founder

former President, Google Dev Group Pretoria, ISOC Zimbabwe Chapter, ZIMNOG

ICANN/IANA TCR - Cryptographic Officer

BSC, Comp Science UNISA, MBA Cardiff Met University, UK
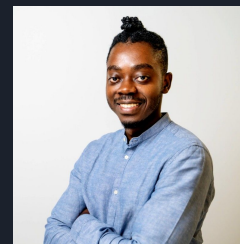
Career Journey:

ZOL Zimbabwe

Liquid Telecom

Huawei - South Africa

Core2Africa - Africa

Meta, EMEA

ASEF

Lord Osei-Ofori

Tech Connect Africa Co-founder

Systems Owner, Brand & Comms Tech Lead - Network Investments PM, Meta

Former PM Google Cloud, Connectivity Analyst

Strategic Partnership, Visual Storytelling, Communication, Data Visualization

Dartmouth College, BA Psychology (Neuroscience) USA

Career Journey:

Google US, GHA

Meta, US

Tech Connect

ASEF

GHANAIAN ACADEMIC & RESEARCH NETWORK

GARNET

Africa Subsea+ Ecosystem Forum : ASEF

Mission

To support Africa's Subsea+ Ecosystem growth and evolution at scale

'Africa from the Inside Out'

ASEF is an Industry Led Initiative supporting development of the Subsea Ecosystem and Industry in Africa - *focused on **increasing and improving local Awareness**, **Education**, **Skills and Industry development**, **Technology** & **Policy***

The idea was formed & crystallized in 2022 after observing a lack of local awareness and low participation of Africans in the Subsea space including global industry forums. It is critical to be involved as industry is growing and has a number of challenges in the supporting disciplines.

*Subsea+ : Defined as focused on Subsea + partnering with the wider capacity demand ecosystem e.g. terrestrial stakeholders delivering capacity to the end user.

Africa Subsea+ Ecosystem Forum

Rationale

A community has a power to rally behind a need. We exist because of needs in this space

"If You Want To Run Fast, Run Alone. If You Want To Run Far, Run Together."

We exist to:

○ **Support the global Industry** impactfully - No one works in a bubble. We all have a role to contribute to the end product

○ **Promote Youth and Minority Development** by **increasing the African Talent pipeline** in the Subsea space. Subsea is a global industry with many experts close to retiring with precious knowledge to transfer. Drives long term **Sustainability**

○ **Support Industry/Technology** - Supporting local innovation and research for new technical solutions, customized for local challenges.

○ **Strengthen the Policy Framework** - With 38 coastal and 16 landlocked countries in African nations, there is great opportunity for better intra and cross regional collaboration to strengthen local policy development , cable and environmental protection, and rapidly drive connectivity

○ Improving Investment and the return of Investments [ROI] for Infra investment

ASEF: Subsea + Ecosystem Initiatives /Work Streams

Solving Specific Industry Problems in collaboration with Global Players to drive quarterly impact and long term sustainable growth

Working groups

| Technical Community Forum | Policy Community Forum | Education & Career development | Industry & Commercial Forum |

Program

PM: Virtual/In-Person workshops - tackling industry problems in a S.M.A.R.T way

ASEF COMMUNITY EVENTS / SUMMITS

Africa Subsea+ Ecosystem Forum : ASEF

ASEF Founding Members

Nomsa Mwayenga

Network Engineer, Meta Network Investments EMEA

former President, Google Dev Group Pretoria SA

ISOC Zimbabwe Founding Member

IANA TCR - Cryptographic Officer

BSC, Comp Science UNISA, MBA Cardiff Met University, UK

Egomaron Jegede

Snr Program Manager, Meta Network Investments, EMEA

Telecoms, E-commerce, Infrastructure (Subsea, Data Centers) & Mgmt Consulting

Presidential Panel for Nigerian National Broadband Plan 2020-2025

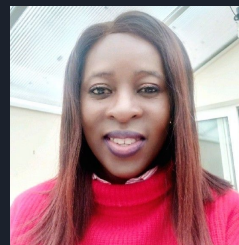**B.Sc. Comp. Eng, Purdue University, W. Lafayette, IN, USA**

Sade Dada

Public Policy Manager, Meta West Africa, EMEA Policy

Connectivity & Innovation Policy ICT Policy, Governance

Policy for Metaverse, Internet, Future Tech: AR, VR, A.I.

Doctor of Jurisprudence, Law Indiana University (IU), Maurer School of Law
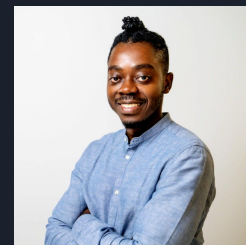**M.Sc. Telecoms Mgmt IU, USA**

Kemi Adeyanju

Regulatory & Permitting Expert Consultant, Subcom EMEA

Public Policy Mgr, Legal Compliance Head,

Government Affairs, Tech Policy, Sustainability, Legal A.I.

University of Lagos, LL.M, Law M.Sc. University of Liverpool Intl. Mgmt. UK

Lord Osei-Ofori

Tech Connect Africa Co-founder Network Investments PM, Meta

Former PM Google Cloud, Connectivity Analyst

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Dartmouth College, BA Psychology (Neuroscience) USA

Subsea Video

Gary Waterworth
Network Investments, Facebook

Some Subsea Cable Systems in Africa

With 20-30 Subsea cable systems landed/in development Africa is still the least connected continent; <25% of its ~1.4Billion people are online. Terrestrial connectivity is still a challenge, while **9 countries have only 1 Subsea Cable**. On the other end **Egypt (15), SA (11), DJB (11), NIG (6), Cameroun (6), GH, SM (5), SUD(5)**

https://submarine-cable-map-2023.telegeography.com/

2Africa	180 Tbps (in progress) 2025	NCSCS	12.8 Tbps
		ACE	12.8 Tbps
Equiano	100 Tbps ('22)	MainOne	10 Tbps
		EASSy	10 Tbps
EllaLink	72 Tbps	GLO-1	2.5 Tbps
PEACE	60 Tbps	TEANS	1.6 Tbps
DARE1	60 Tbps	LION2	1.3 Tbps
SACS	40 Tbps	SAT3/SAFE	800 Gbps
SAIL	32 Tbps	SEAS	320 Gbps
METISS	24 Tbps		
SHARE	16 Tbps		
WACS	14.5 Tbps		

*Sources:
https://www.submarinenetworks.com/en/africa

http://manypossibilities.net/african-undersea-cables

https://www.submarinecablemap.com/

Subsea Cable Ecosystem and Impact on the Internet

- Connects continents.

- ~95% of Global internet traffic is carried by Subsea Cables. ~5% by Satellite.

- Delivers best quality of service .

- Most used by financial institutions~$$$ Trillions in financial transfers are done via SWIFT global banks across Subsea system

- Data Centers /Cloud computing centers across continents are connected via Subsea

A single subsea cable of 90 Tbps capacity can carry roughly 18 Million 1080p streamed movies at the same time!

Countries	Subsea Cables	Internet Penetration (*Statista 2023)
Egypt	15	81%
South Africa	11	72%
Djibouti	11	69%
Nigeria, Cameroun, Kenya	6	55%, 45%, 33%
Ghana	5	68%
Republic of Congo	1	22%
Togo	1	35%
Liberia	1	33%
Gambia	1	33%
Ethiopia	Land locked	16 %

Some Challenges and Gaps in the African Subsea+ Ecosystem

- **Submarine Cable Cuts** - Recently Aug 6, 2023 an undersea landslide cut 2 major cables and disrupted internet across West Africa impacting SA and other countries. Repair time is based on vessels available

- **Education and Awareness Gap** - Few people outside of the industry are aware of the Ecosystem, its importance, career opportunities and low education/marketing in Africa (Highschool, University etc)

- **Talent Gaps** - Lack of local skilled workers, local manufacturers and companies means contracting international engineers/consultants, divers, ships etc for local survey, installation and repair work

- **Restrictive Policy and Regulatory Gaps** - It is complex to land a cable, Permitting, Regulatory processes, and Policies sometimes inhibit rapid roll out of fiber. Terrestrial connectivity between countries can be cost prohibitive due to fees and emerging business cases.

- **Terrestrial Connectivity Gap**s in Africa - Lack of Partnership and Collaboration to speedily drive connectivity into landlocked countries, Funding and ROI factors

- **End User Demand - Availability, Affordability, Reliability, Relevance and Adoption Gaps** for end users which drives demand across the network

- **GeoPolitical Issues** - Stability in African Countries - Coups and Conflict, Political decisions impact Internet delivery

Industry Players Working to Develop Internet Infrastructure Globally

Meta | ALCATEL SUBMARINE NETWORKS | amazon | airtel | Aviat NETWORKS | axiata

BT | Edge-core | etisalat | EQUINIX | Google | intel

Internet Society | Microsoft | MTN | NEC | orange | NTT | Rakuten

stc | SUBCOM | Tech Mahindra | Telefónica | Telia Company | TIM

ADVA | T Mobile | TNO innovation for life | ufiSpace | vodacom | we

ASEF seeks to partner with industry players.

Interactive Team Session - Solve a Subsea Challenge!

- **Submarine Cable Cuts** - Recently in May & Aug, 2023 an undersea landslide cut 1 then 3 major cables and disrupted internet across West Africa impacting SA and other countries. Repair time is based on vessels available. The countries need your help and the internet is down!

- WHAT WOULD YOU DO IF YOU HAD TO FIX A SUBSEA CABLE CUT ??

- IN YOUR GROUPS WRITE DOWN - 5 MAJOR STEPS YOU WOULD TAKE TO GET GHANA BACK ONLINE! [10 MINS]

- PICK 1 PERSON TO PRESENT YOUR SOLUTION - 2 MINS EACH

- SHARE YOUR 5 STEPS [TEAMWORK IS KEY]

Solve a Subsea Challenge - WHAT WE ACTUALLY DID!

- **Submarine Cable Cuts** - Recently May & Aug, 2023 an undersea landslide cut 3 major cables and disrupted internet across West Africa impacting SA and other countries. Repair time is based on vessels available

- Connectivity in Lagos, NG and Cape Town, SA were affected. 1 cable then 3 Cables cut (x100Gs)

- 1. All Hands on Deck: Form a Cross Functional Team to Respond - Network Teams, Traffic teams, Legal Team, Submarine Teams. [Project Management, Problem Solving and Comms]

- 2. Identify where the cut happened, Get a Vessel Sent to Repair ETA Sep - Oct 2023

- 3. Source alternative Links to Provide Capacity - Swap on Other Cables + Terrestrial Links, Sign Contracts

- 4. Technical teams provision new circuits and manage flow of data on the networks

- 5. Develop a long term strategy with lessons learned to close gaps and have backups including tools, dashboards and system analysis while cable is being repaired

- In parallel communication with your stakeholders - Telcos, ISPs, Regulators, Govt agencies, Vessels, etc.

Some Industry Efforts and Collaboration

Sub Optic Foundation - Non Profit Org. supporting education and research initiatives

- SubOptic Institute - Curriculum and degrees in the Submarine space
  - UC Berkeley (Undergraduate–Spring '24) • UNIGE–Genoa, Italy–Summer/ Fall' 24 • College of Coastal Georgia (TBD)
- Summer Schools (2019 & 2022) - In Partnership with **Optica Foundation and Google**
- Mentorship Program
- Local Language/Regional Symposia 2023 - Optical Fiber Workshop in Cape Town, SA

Google - Summer School and Optical Fiber Workshops

Meta - Submarine/Engineering Internships, Workshops and Trainings

A2Sea Apprenticeships

Vodafone Apprenticeship

Opportunities and Next Steps

2023

- ASEF x ITW (Kenya) - **Sep 2023**

- ASEF x AIS (SA)   - **Sep 2023**

- ASEF x AfriTech (SA) - **Nov 2023**

- ASEF & TechConnect (Kenya, Ghana, Nigeria, South Africa) - **Dec 2023** [Outreach to universities + Students in each country]

- ASEF x Industry Partnerships - Collaboration Discussions in Progress

2024 & Beyond

Quarterly Initiatives on the 5 Workstreams

- **Education & Awareness**
- **Policy**
- **Industry**
- **Technology/ Research**
- **Program Management & 2024 Summit**

Connect with us if interested in partnering with ASEF on our initiatives and work streams across Africa!!

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A snapshot of Subsea+ Ecosystem Public Resources

- Meta - Building 2Africa

- 2Africa Cable Website

- Google Equiano

- Microsoft Marea

- ASN

- Subcom.com

- NEC

- Orange Marine

- WIOCC

- SubOptic

- Vodafone

- MTN Global Connect

- Submarine Networks EMEA

- Subseacablenews

- ITU ECOWAS Regulation

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Considering a career @ Meta?