

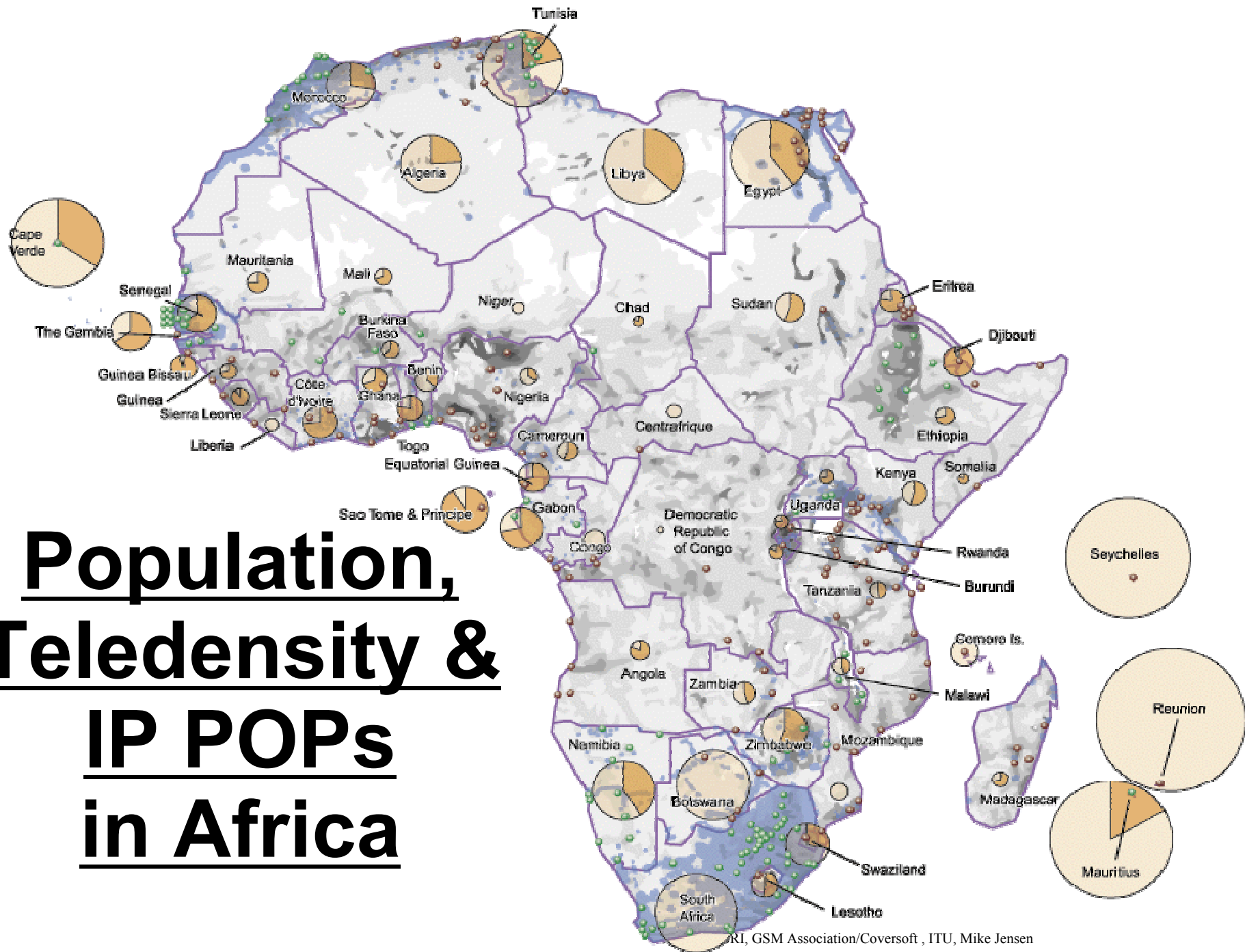
# *Digital Divide Issues for RE Networks in Africa*

*International ICFA Workshop on  
HEP Networking, Grid & Digital Divide  
Issues for Global e-Science*

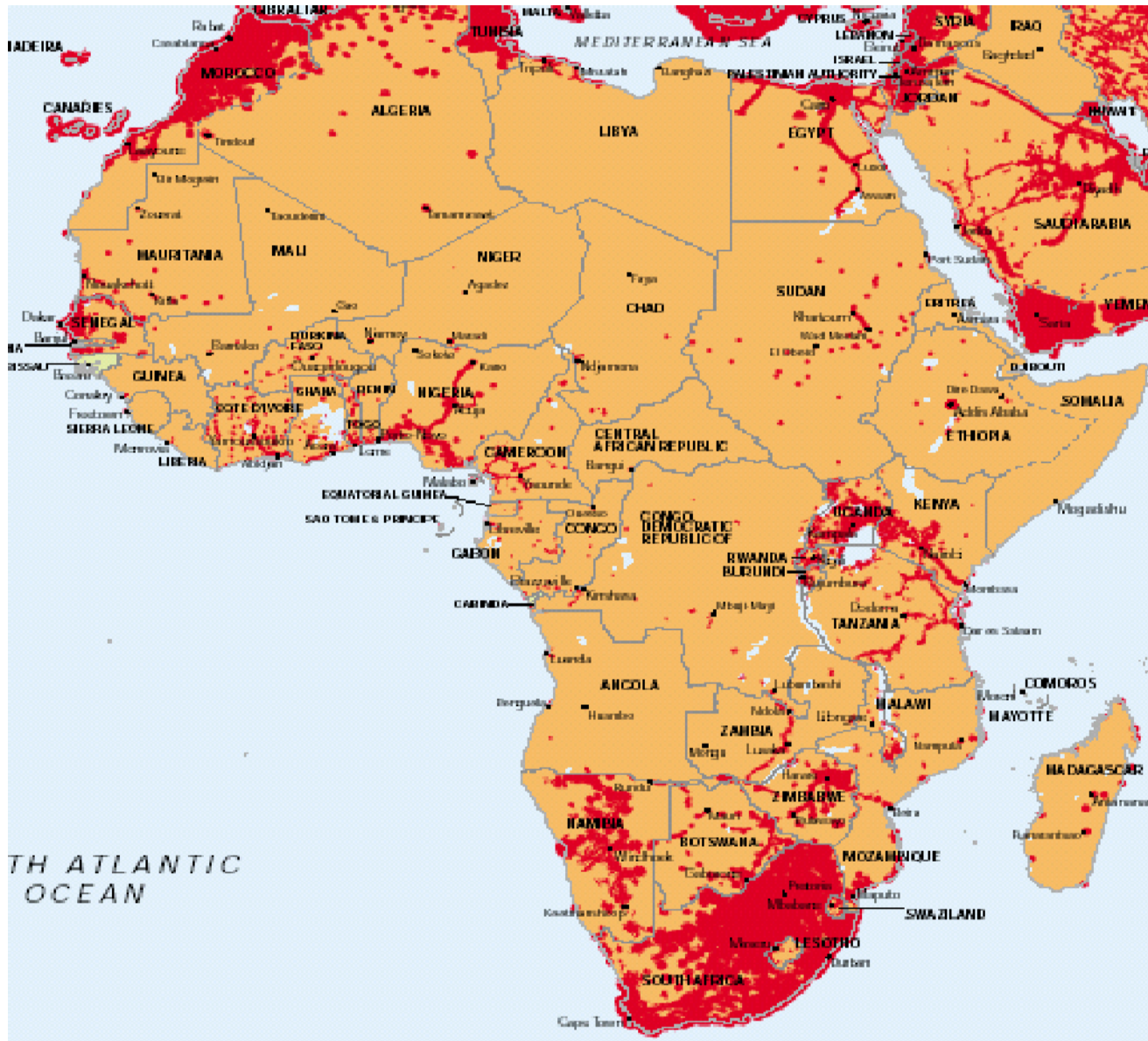
*Tues, May 24 2005  
Daegu, Korea*

*Mike Jensen  
International Development Research Centre  
(Canada)  
mikej@sn.apc.org*

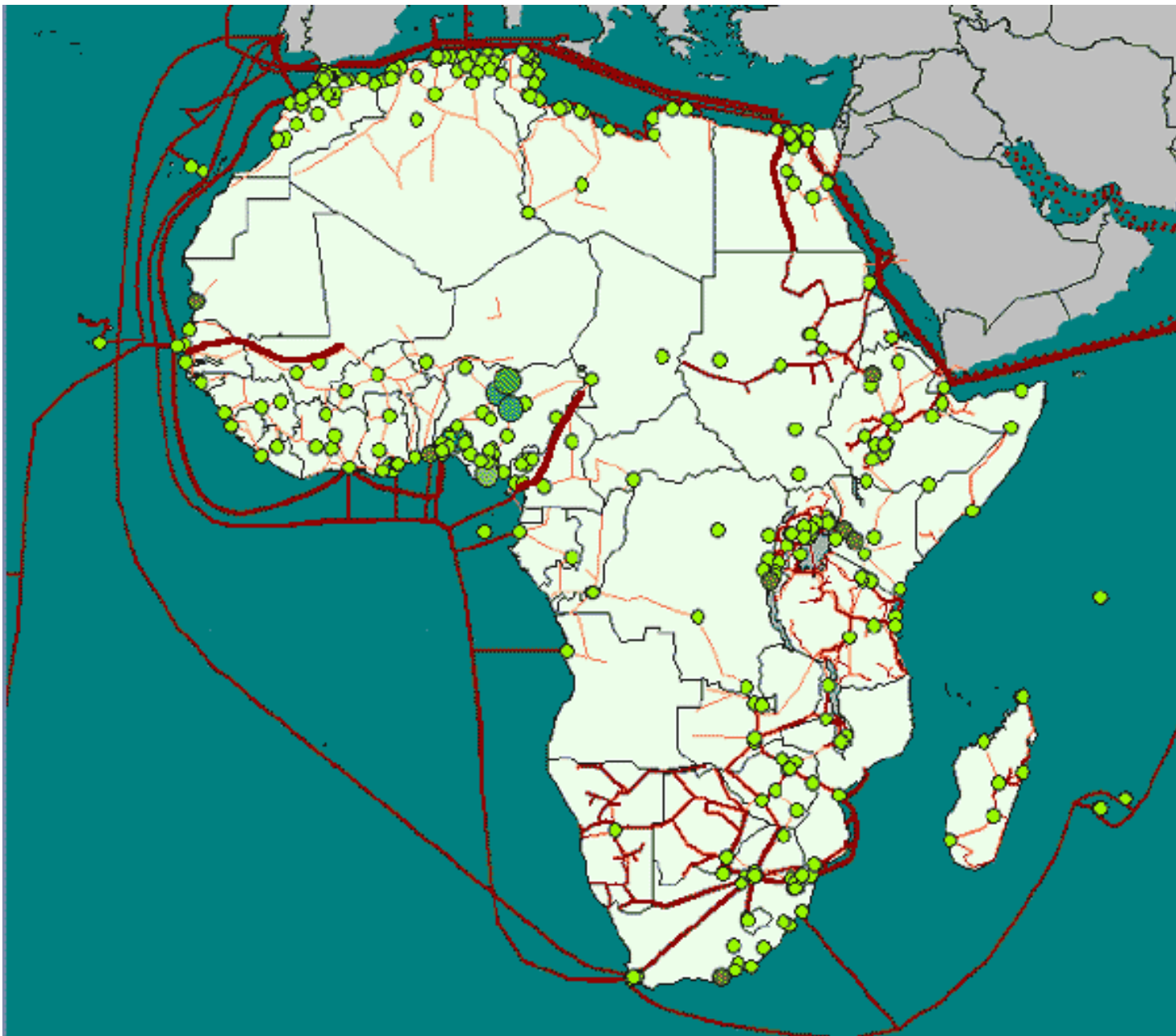
# Population, Teledensity & IP POPs in Africa

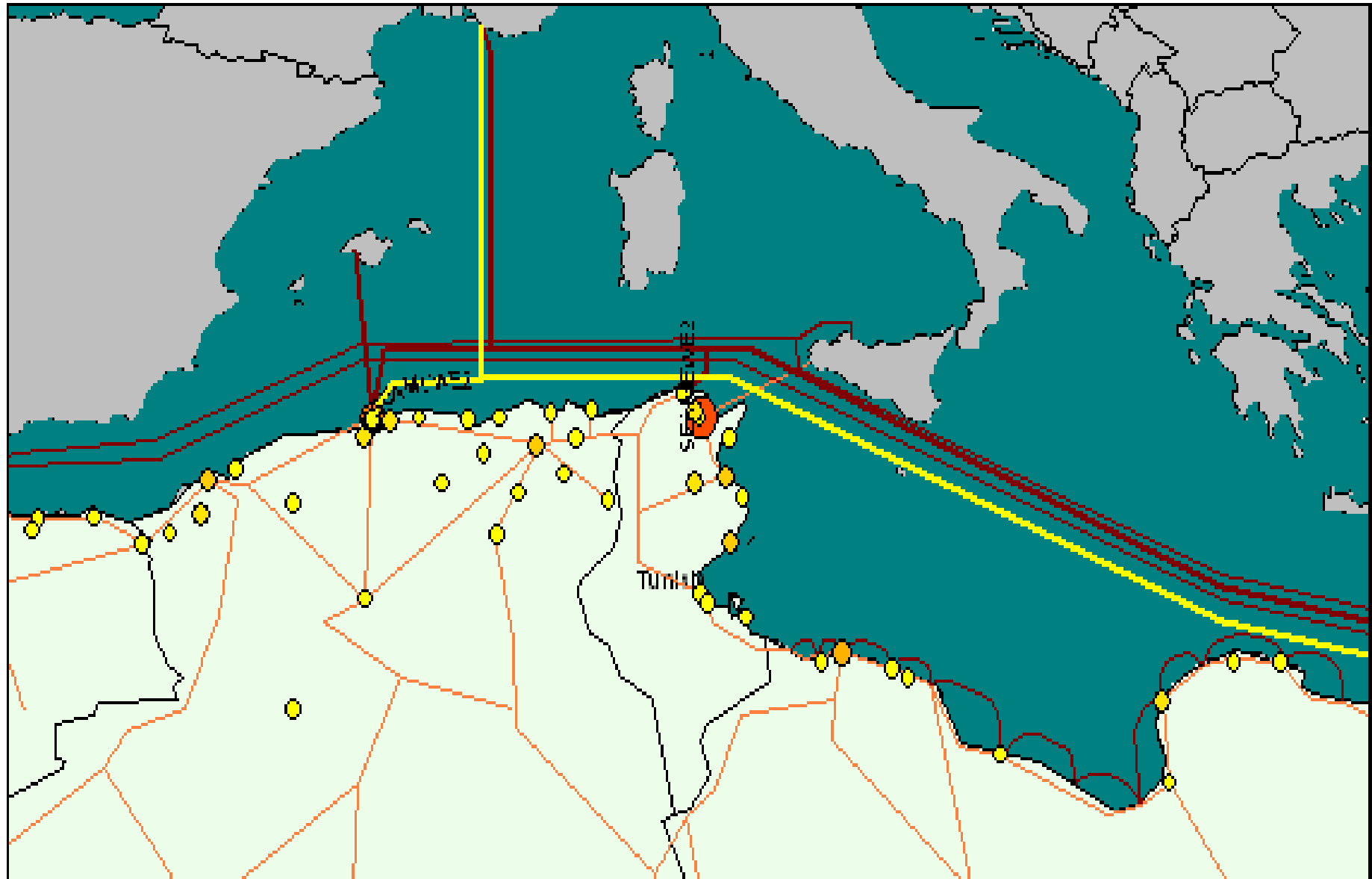


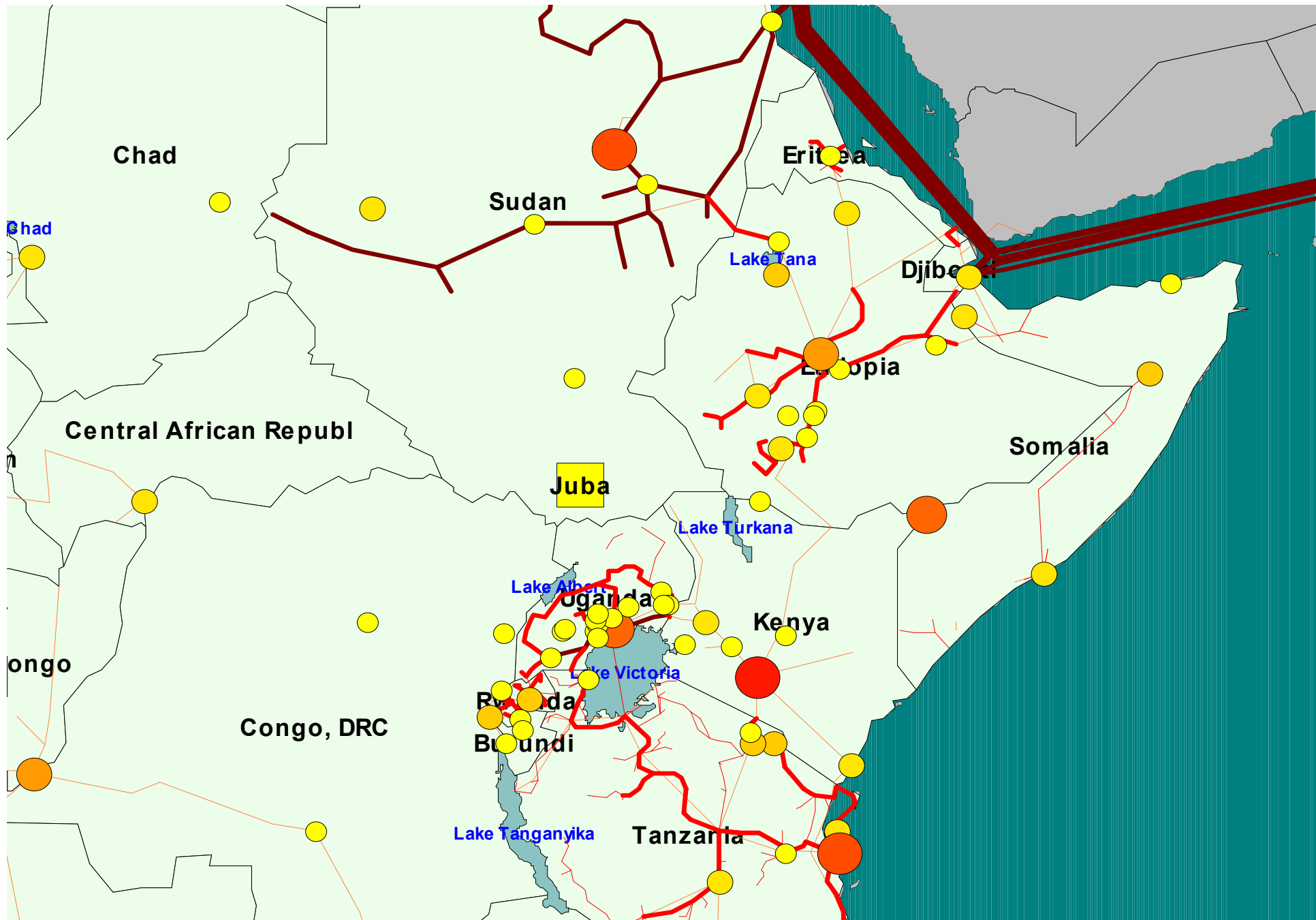
# Wireless GSM Coverage

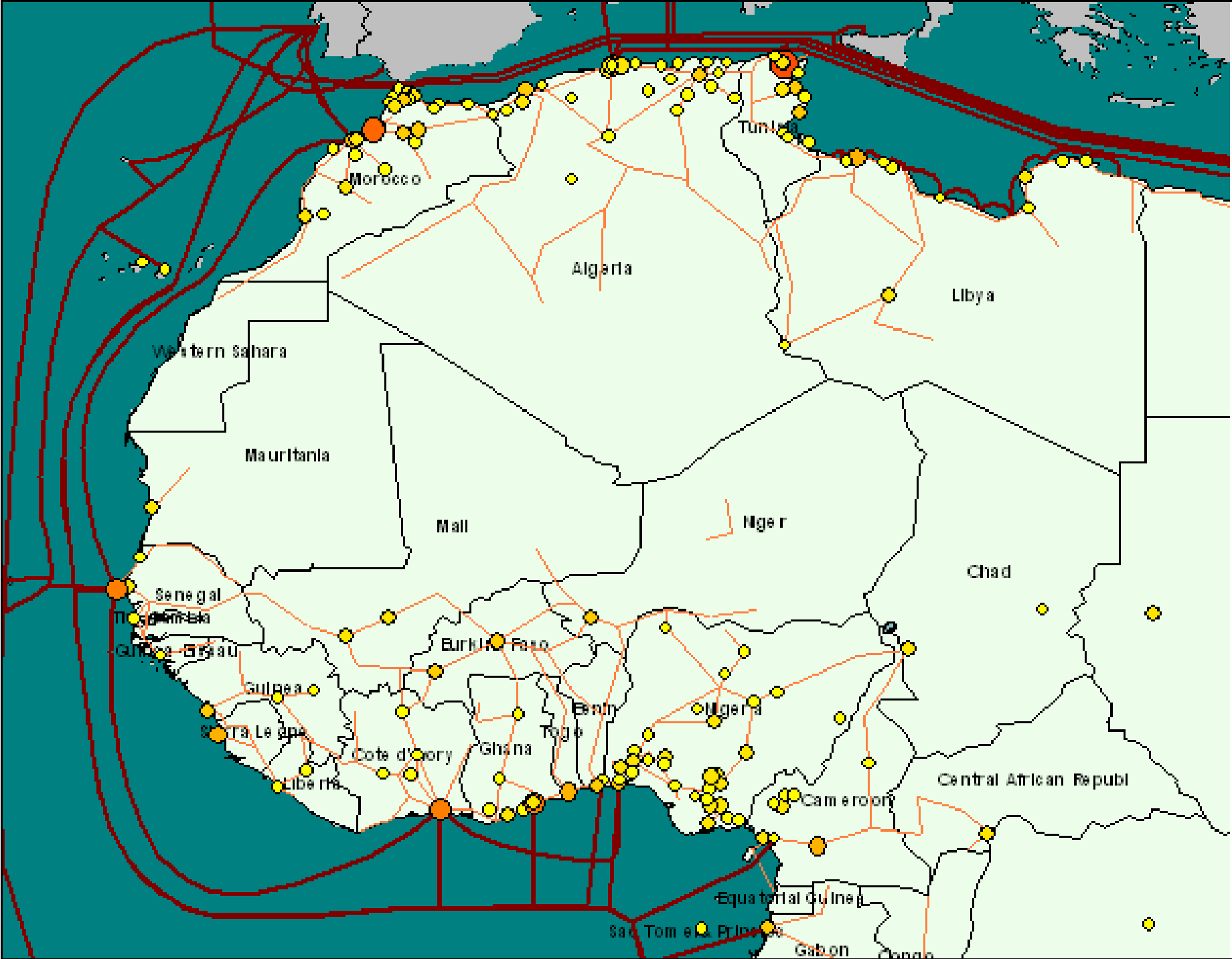


# International & National Backbones









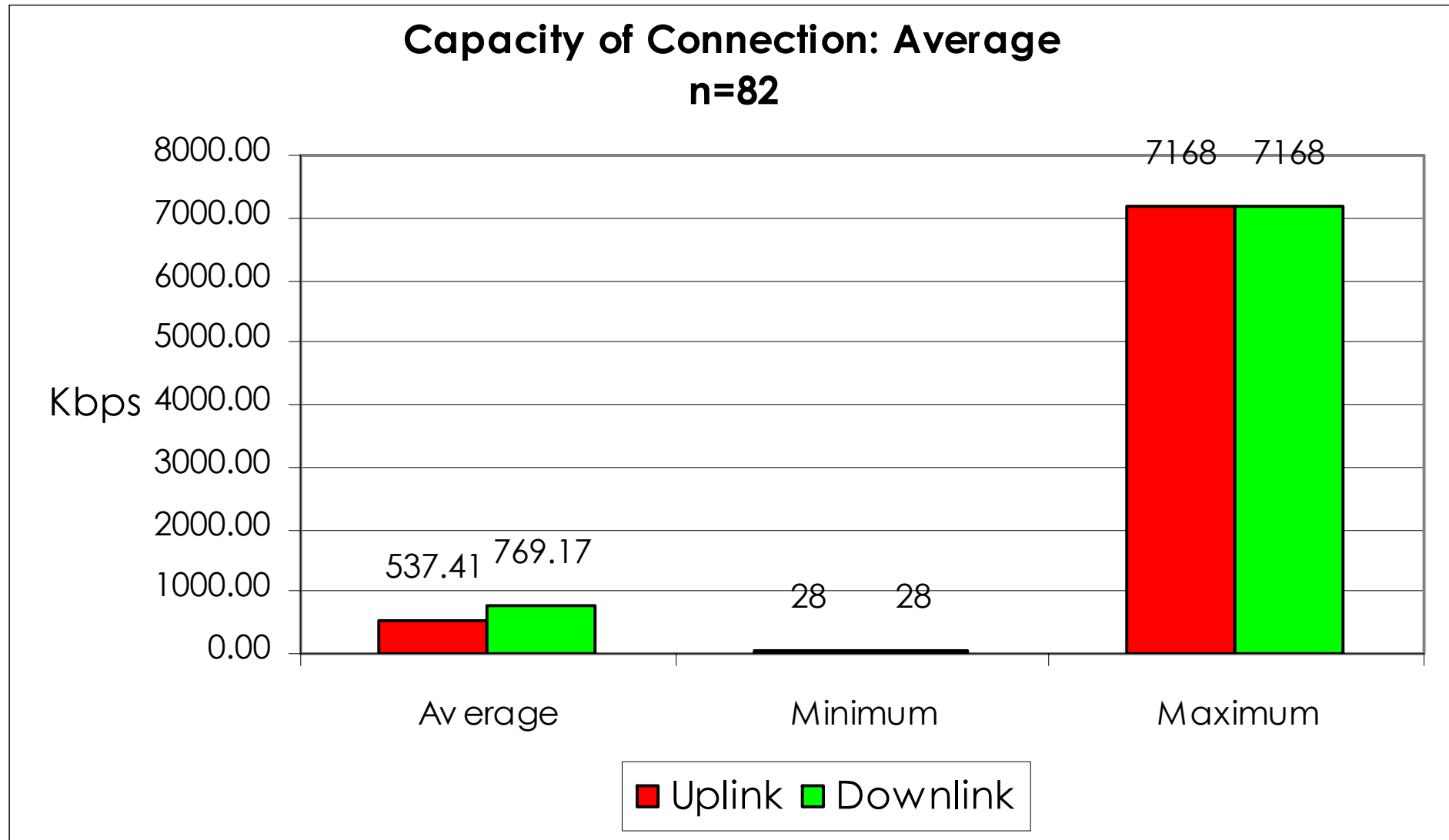
**Many  
systemic  
factors:**

Electricity,  
Import duties,  
Skills

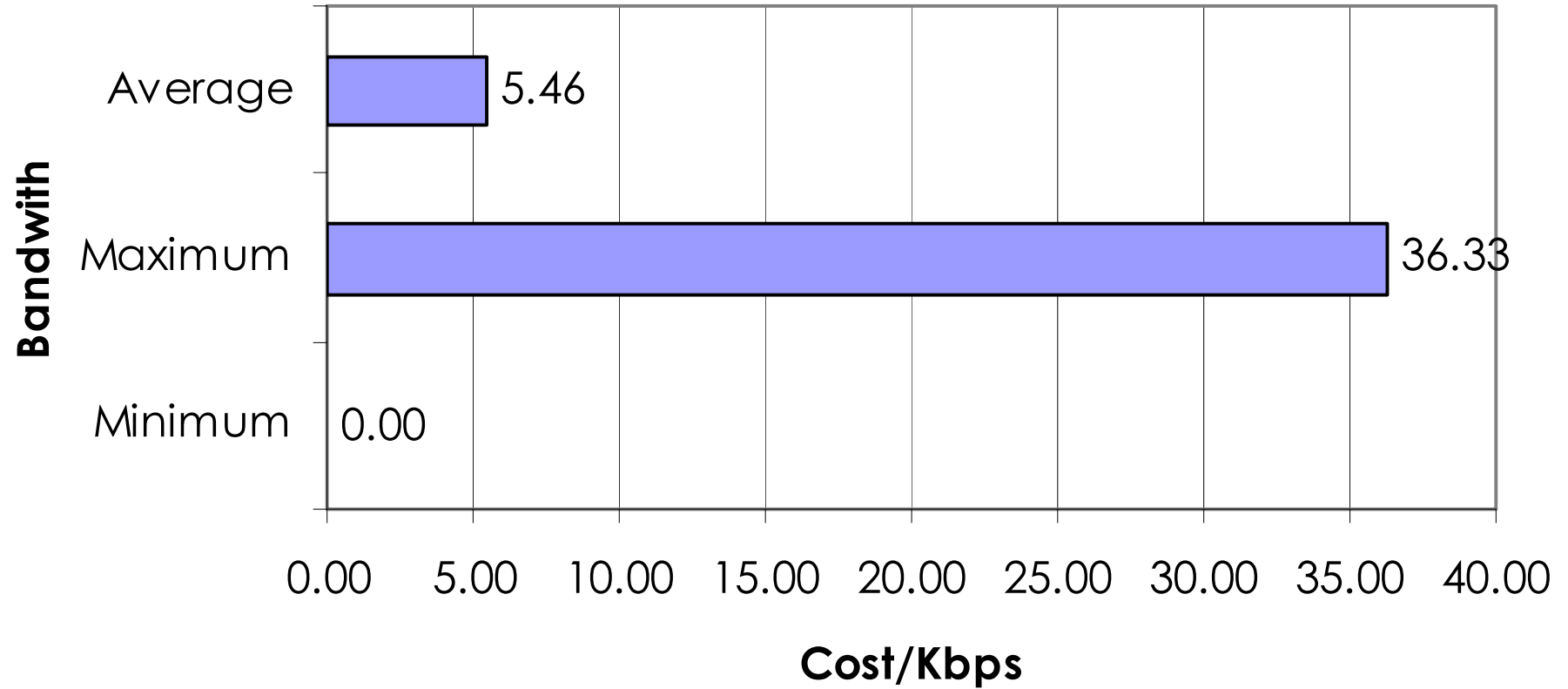




# African Tertiary Institution Connectivity Survey (ATICS.INFO)

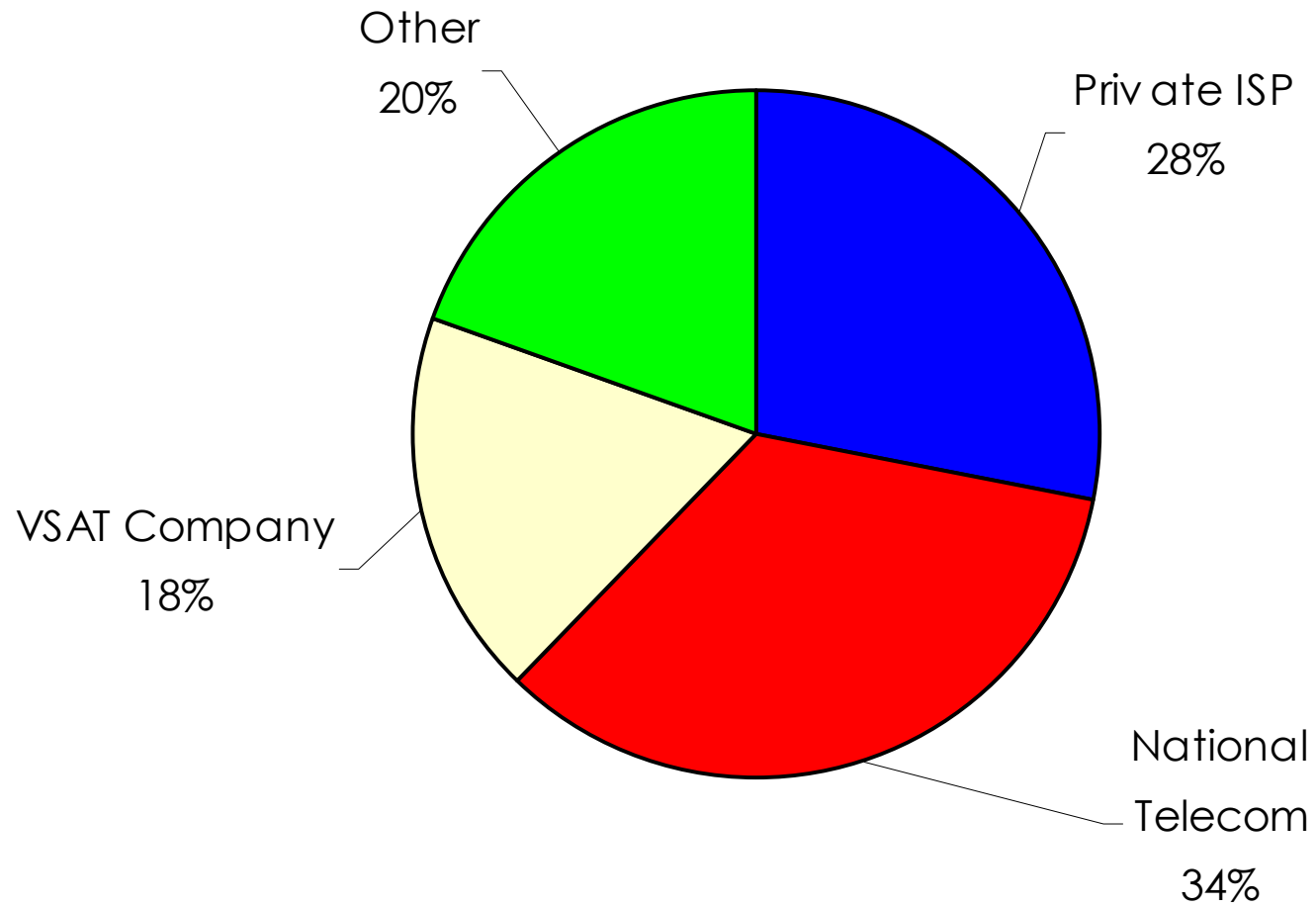


### Average Cost per Kbps n=70



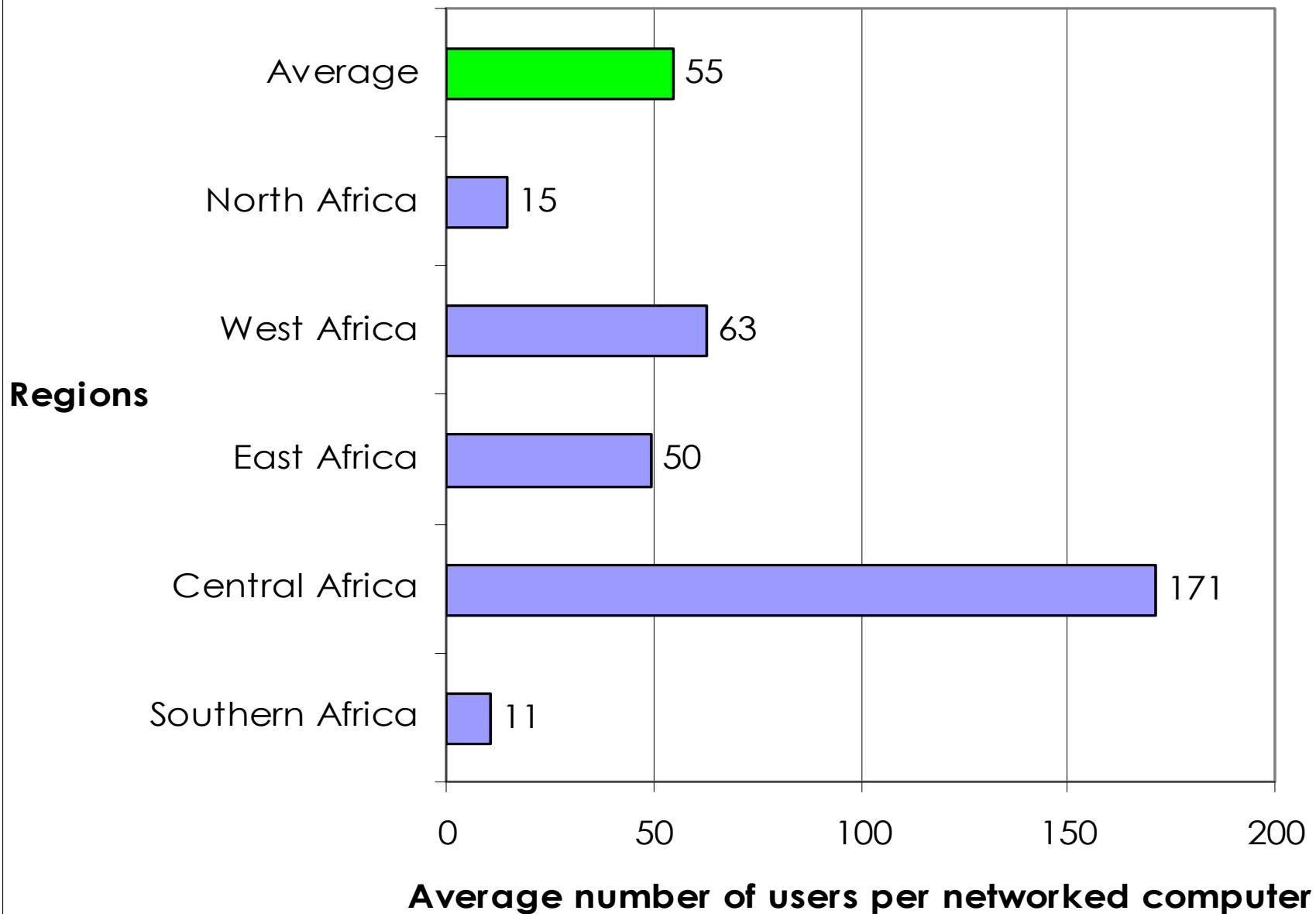
# Service Provider Type

n=82

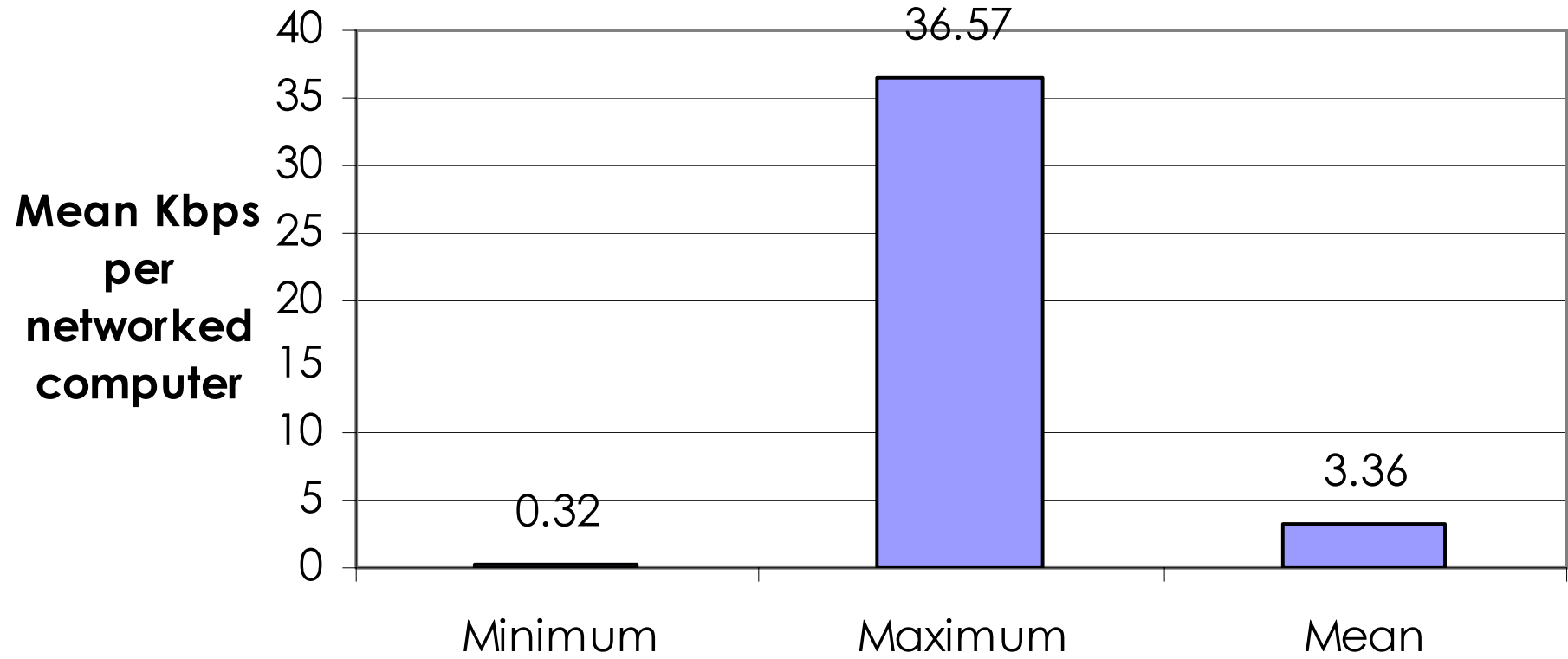


# Users per networked computers by regions

n=66

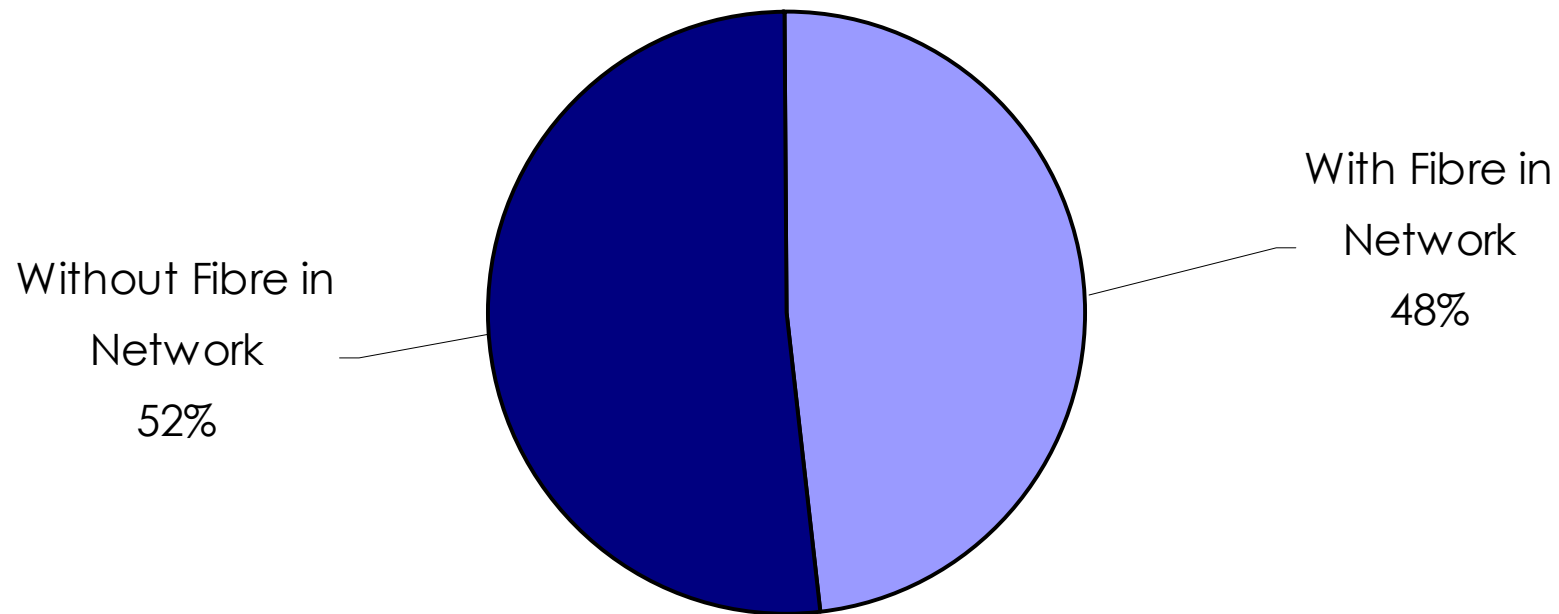


### Bandwidth per networked computer n=73



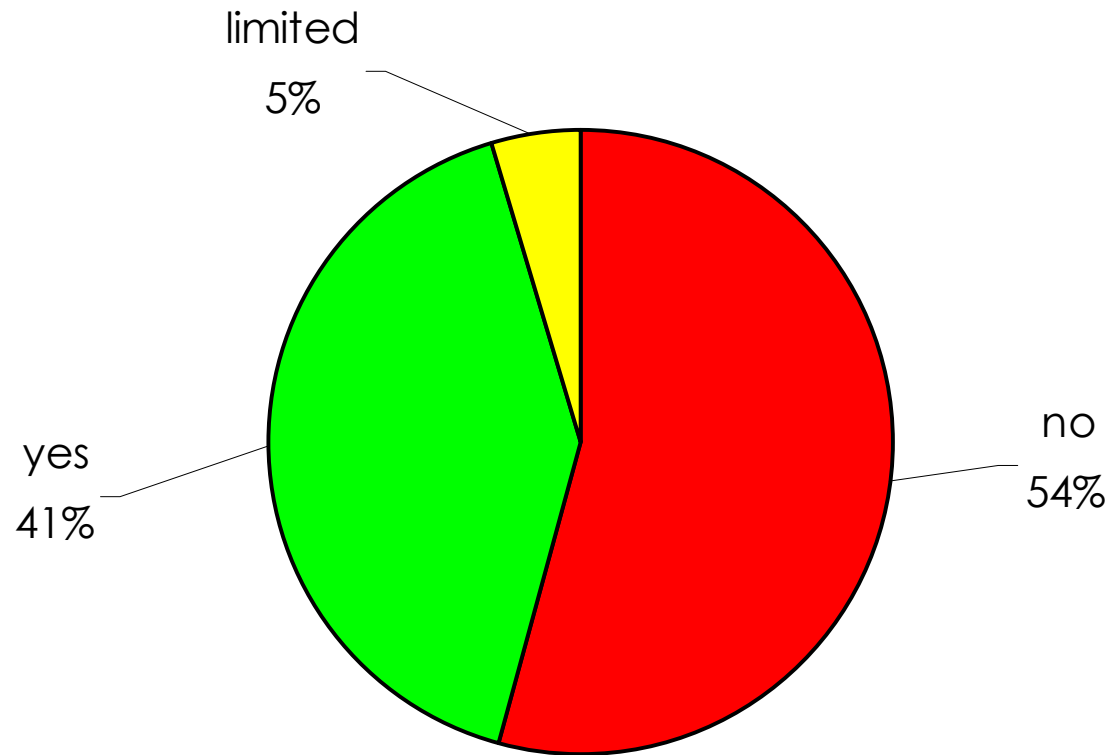
## Campus Networks Utilizing Fibre Technology in Surveyed Institutions

n=83

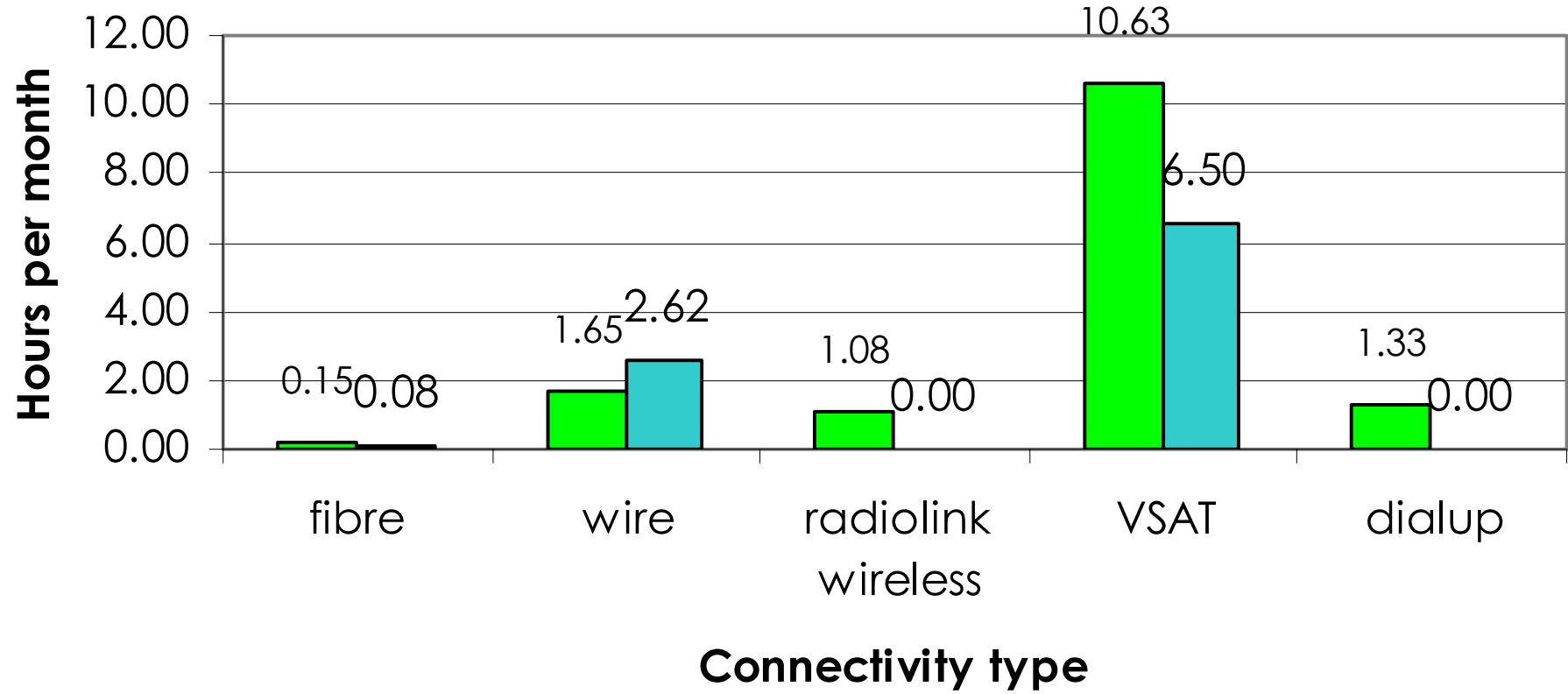


**Do you manage your bandwidth in any way?**

**N=83**



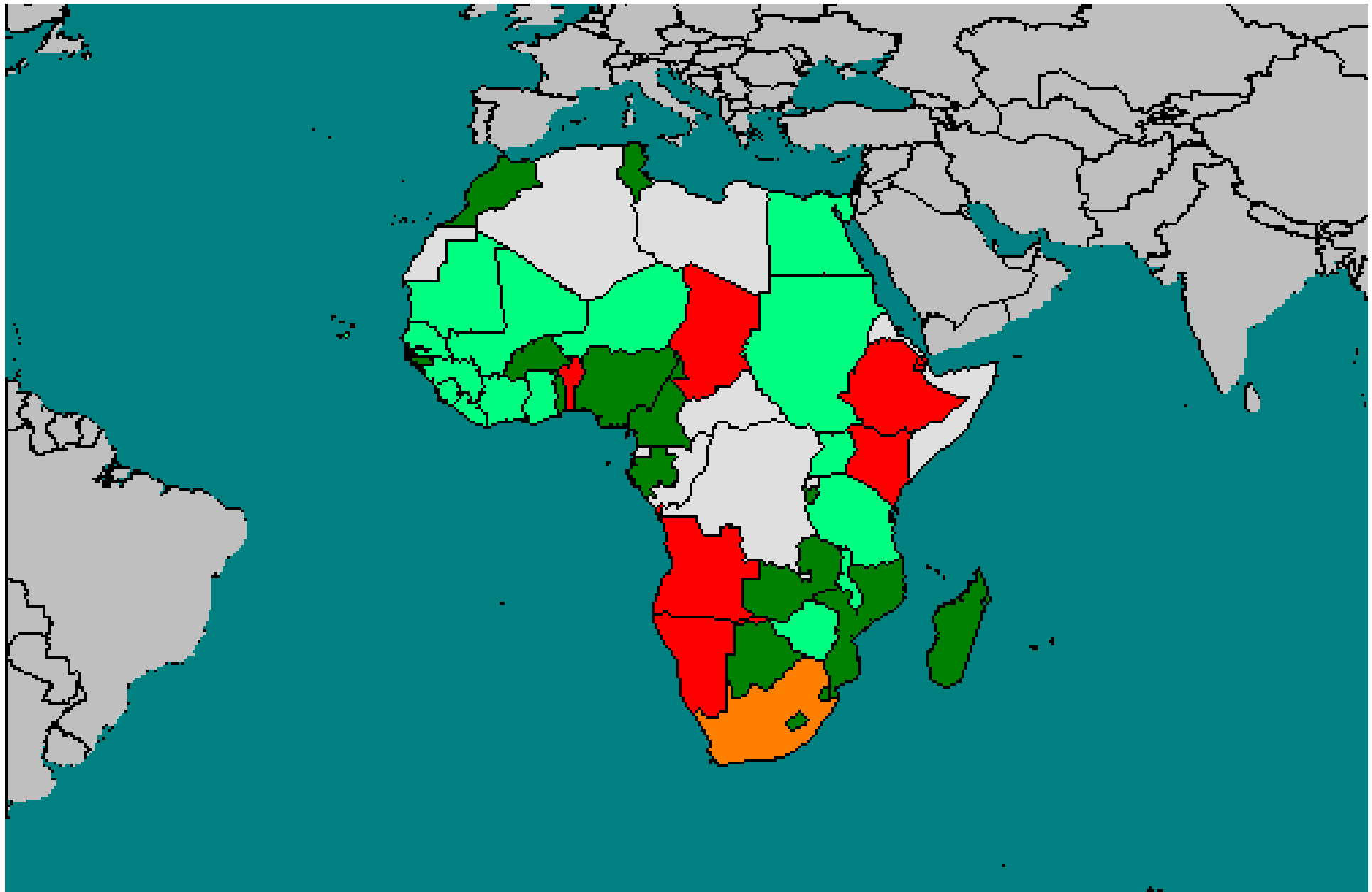
### Average hours link is down/month by type of connectivity n=82



- Average Hours/Month link Down
- Average Hours/Month link Down due to electricity cuts



# Satellite Regulation



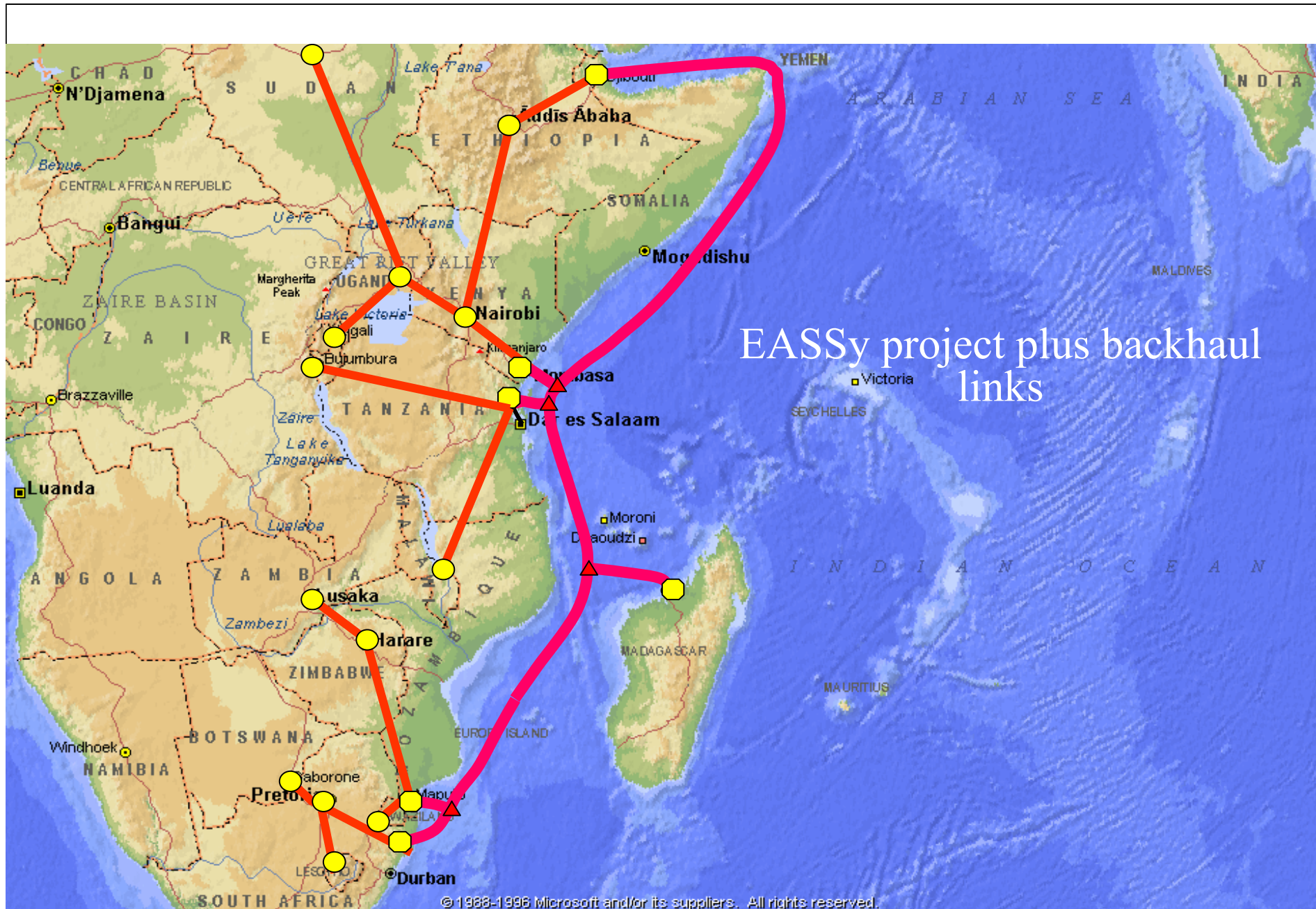
# **Restrictive Regulatory Environment - The Key Barrier**

- **State owned monopolies still dominate**
- **Some foreign investment in monopolies in return for continued exclusivity**
- **Mauritius trying to buy out its monopoly**
- **Limited introduction of competition - 1 or 2 additional fixed line players in a few countries**
- **Use of satellite, and wireless data (Wifi/Wimax etc) restricted in most countries**

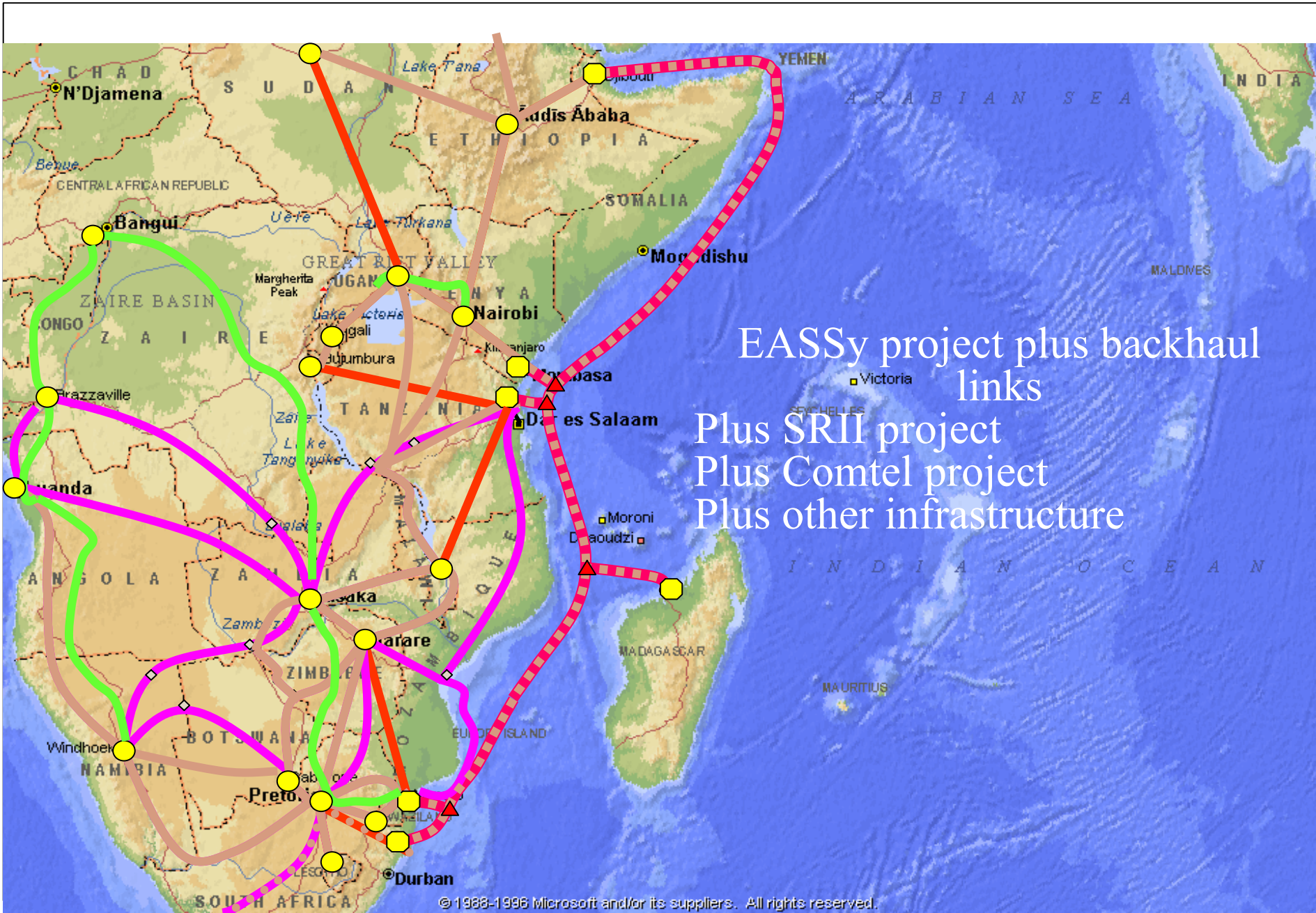
# Other Considerations

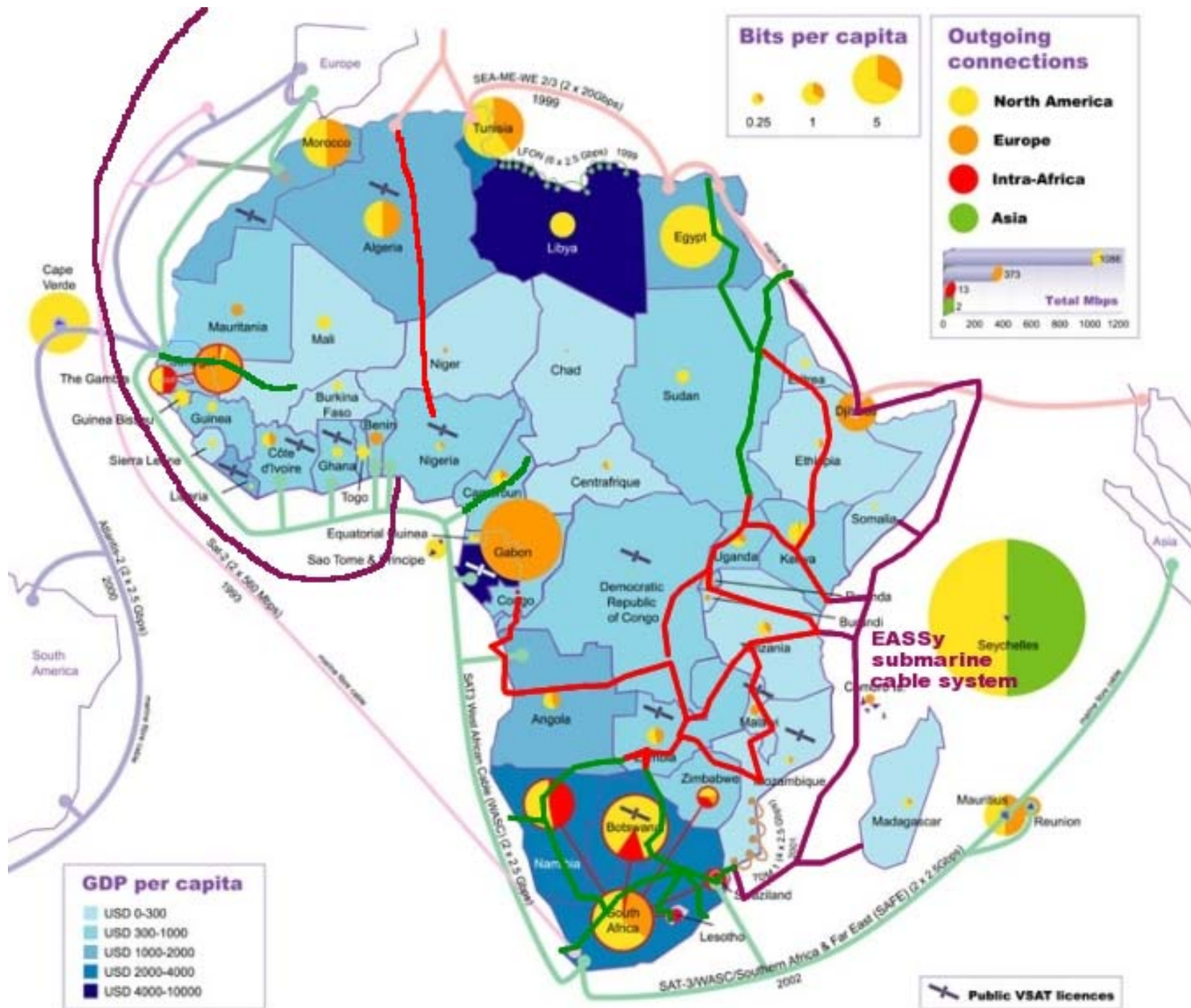
- **No benefit in Africa from Dot-Com/ bubble burst**
- **Little use of alternative infrastructure**
- **No access to dark fibre**
- **Few peering points (SA, Tanzania, Kenya, Mozambique)**
- **V little capacity to design, implement and manage networks**
- **E-Rate only in a few countries – Senegal and South Africa**
- **Few NRENS as yet**
- **Most institutions are fairly isolated, v limited skills**
- **Human networks are undeveloped**
- **No access to commodity Internet via Geant/NSF**

# East African Regional Network Plans









**GDP per capita**

- USD 0-300
- USD 300-1000
- USD 1000-2000
- USD 2000-4000
- USD 4000-10000

**Bits per capita**

- 0.25
- 1
- 5

**Outgoing connections**

- North America
- Europe
- Intra-Africa
- Asia



**EASSy submarine cable system**

**Public VSAT licences**



# R&E Support Activities

- **African Virtual University (AVU) – 24 campus links**
- **Partnership for Higher Education in Africa – b/w purchasing consortium**
- **International Network for Availability of Scientific Publications (INASP) b/w management workshops**
- **Advanced Institute for Mathematical Sciences (AIMS) in SA with Department of Science and Technology developed NEPAD proposal for connectivity to 20 African tertiary institutions**
- **WB funded AVU to survey 100 R&E agencies in 50 African countries (atics.info), WB Africa desk also discussing other options**
- **Millenium Science Initiative (MSI) initiatives planned in Uganda, Cameroon, Botswana and Namibia and Tanzania**

# Support Activities (2)

- **UN University (UNU) developing a proposal in collaboration with the ITU to establish an African Universities Network (AUN)**
- **USAID supports the development of Internet connectivity for some African Universities as part of the Leland Project**
- **World Association of Industrial and Technological Research Organisations (WAITRO) is assisting in building the capacity of its 48 members in 25 countries comprising all the major research and technology organisations (RTOs) on the continent. CSIR in South Africa is African focal point.**
- **Initiatives to provide electronic content identify**



# **Support Activities (3)**

**French/Canadian government projects:**

**The Organisation Internationale de la Francophonie (OIF) hosts the Agence Universitaire de la Francophonie (AUF) in charge of project cooperation between universities. The AUF have a variety of university support programmes such as the Campus numérique and ADEN**

**Scientific and Technical Information System (SIST) promotes integration of African research in the international scientific networks, develops tools for sharing S&T info to encourage African production of S&T data**

**RESAFAD (Réseau Africain de Formation à Distance) will foster use of ICTs in the education systems of ten French -speaking African countries, provide distance learning for ICT trainers + support for pilot projects with civil society**

**Projets COMETES & MADSUP: training trainers in the field of ICTs, developing tools for sharing S&T info and institutional support, interconnect Universities in Madagascar and Cameroon**

# Support Activities (4)

- **NSF/IEEAF in the US supporting initiatives to bring better bandwidth African institutions**
- **GEANT provides link to South Africa via SAT-3**
- **The Georgia Institute of Technology has developed the NectarNet project to support the development of high speed links to key points in Africa, most notably South Africa and points in West Africa including Senegal**
- **The EU supports EUMEDCONNECT and EMISPHER Projects - Euro-Mediterranean Internet-Satellite Platform for Health, Medical, Education and Research co-ordinated by DANTE, project connects NRENs in North Africa to GEANT**
- **IDRC promotes information exchange, research on networks and human networking - sponsors events and participation - via PAREN project – Promoting African Research and Education Networks**

# **Support Activities (5)**

- The Multilateral Initiative on Malaria (MIM) research network Mimcom supported by the US National Institutes of Health, providing connectivity to a variety of African medical research organisations**
- The International Center for Theoretical Physics (ICTP) has been assisting with capacity building for improved Internet connectivity in a variety of African Universities**
- Global University System (GUS) aims to establish a worldwide e-learning system for higher education -Ethiopia (U's of Addis, Bahr Dar and Debub), Nigeria (OAU), Uganda (UNCST), and Malawi (U of Malawi)**
- India in talks with African Union to build a satellite for academic and health networks in Africa**

# **African Stakeholder Activities**

- Kenya, Uganda, South Africa, Tanzania and most of North Africa now have NRENS which could help consolidate bandwidth requirements and provide capacity building**
- The Southern African Regional Universities Association (SARUA) has been tasked by the SA Dept of Science and Technology to look at the feasibility of establishing a Southern African Research and Education Network**
- At its 11<sup>th</sup> AGM in Feb '05, the African Association of Universities (AAU) decided that b/w is a priority issue and is carrying out a strategy planning process leading to WSIS event / announcement**

**Questions?**