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Horn Economic and Social Policy Institute

Assessing Cross-Border (C-B) Infrastructure Cooperation in the Horn of Africa (HoA) Region

Horn Economic & Social Policy Institute

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Outline:

- ❑ Background
- ❑ Objective, Scope & Method
- ❑ Progress in C-B infrastructure in HoA
- ❑ Features of C-B infrastructure cooperation in HoA,
Challenges and Lessons
- ❑ Gulf-HoA Cooperation
- ❑ The Way Forward

Background

□ Why is there a need for C-B (transport, power, ICT) infrastructure?

- C-B transport Connectivity:
 - Better linkage with global supply chains and distribution networks, enhance competitiveness
 - Example: infrastructure development induced trade expansion was responsible for Asia's growth miracle (Brooks, 2008).
 - Promotes regional trade and integration (AfCFTA)
- C-B Power Connectivity:
 - Access to clean and cheap electricity for households and businesses.
- C-B ICT Connectivity:
 - Access to submarine cables, that allow cheaper and widespread network of broadband internet compared to Satellites
 - Digital economy

Background

□ C-B infrastructure being given increasing attention

- UN-SDG goal #9 (promoting sustainable regional infrastructure)
- Aspiration #2 of AU's Agenda 2063 (develop world class infrastructure that crisis-crosses the continent)
- IGAD strategy 2016 (develop essential infrastructure for regional integration and cooperation)
- HoA initiative identified C-B transport, power projects among others
- National Development Plans (e.g. Kenya vision 2030)

Background

- The HoA region has one of the lowest regional transport, power and ICT connectivity
 - Poor Logistics Performance Index
 - Low access to electricity and Electricity consumption per capita.
 - Low Mobile cellular subscription and fixed broadband subscription
 - As a result, **cost of doing business high**, rendering the region **uncompetitive**.

Table : Inter regional Comparison of Access to Infrastructure Indicators

Region	LPI (2016)	Access to electricity (2018)	Electricity consumption in KWh (2014)	Mobile Cellular subscription per 100 inhabitants (2015)	Fixed broadband subscription per 100 inhabitants (2015)
South Asia	2.62	91.6	705	76	1.41
Latin America & Caribbean	2.66	98.0	2155	111	10.78
Middle East & North Africa	2.89	100.0	2896	110	7.01
East Asia & Pacific	3.14	98.3	3677	104	16.49
Europe & Central Asia	3.23	96.5	5376	124	24.8
Sub-Saharan Africa	2.47	47.7	486	76	0.37
HoA	2.5	49.5	117	45	0.54

Background

□ Cooperation is key for successful C-B infrastructure

- C-B infrastructure Involve two or more countries with:
 - Different policy priorities.
 - Investment and trade laws.
- Success in C-B infrastructure depends on:
 - Cooperation at political leadership and institution level
 - Negotiate and agree on cost-benefit distribution and Financing
 - Harmonization of national laws
 - Establishment of Supranational institutions
- Thus, the need for assessing C-B infrastructure cooperation in the HoA is timely.

Objective, Method & Scope

□ Objective:

- The study aims to assess the state of C-B infrastructure cooperation in the HoA.
- Specifically it aims to:
 - assess the progress in stock of c-b infrastructure (transport, energy and ICT)
 - assess the nature of cooperation in building and operating c-b infrastructure
 - identify challenges hindering progress
 - indicate way forward for national governments, regional organizations and donors on how to promote c-b infrastructure.

□ Method:

- Descriptive analysis using data from secondary sources (e.g. WDI, ITU)
- Qualitative analysis (KII, FGD)
- Case study Analysis

□ Scope:

- Transport (road, railway, port)
- Power (renewable energy sources)
- ICT (land-based infrastructure)

Progress in C-B infrastructure: Transport

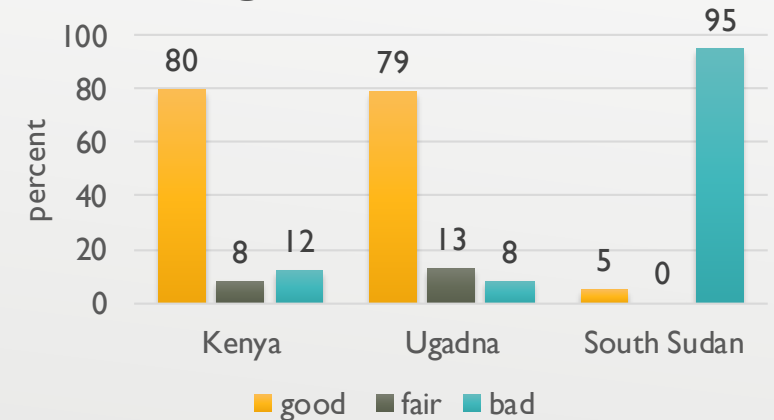
- ❑ Significant progress in Kenya, Ethiopia, Uganda, Djibouti, Sudan in the last two decades:
 - Upgrading , rehabilitating road connection to neighbors or ports
 - Constructing Standard Gauge Railway (SGR) connection to neighbors or ports
 - Port development and expansion
- ❑ Little or no progress in Somalia, South Sudan and Eritrea
- ❑ Major Transport Corridors are:
 - Kenya-Uganda-South Sudan (KUS)
 - Ethiopia-Djibouti, and
 - LAPSSET corridors

Progress in C-B infrastructure: Transport

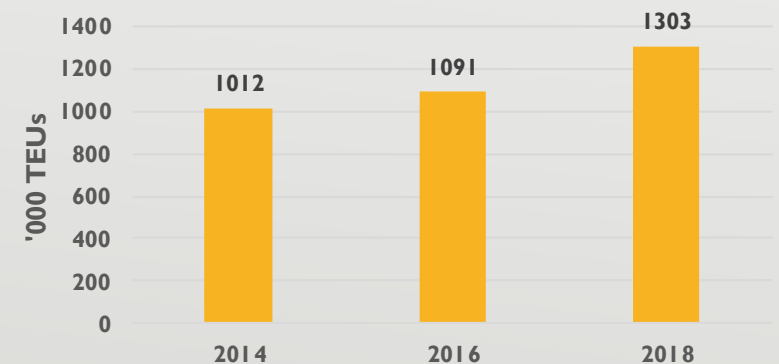
□ Kenya-Uganda-South Sudan (KUS) Corridor:

- Road and SGR link to Mombasa port
- Road conditions
- SGR:
 - Mombasa-NICD operational in 2018
 - Rail Cargo volume rose, but, truck still dominate (absent last mile connections in KEN and slow progress in UG & SS)
- Mombasa Port:
 - Recent port developments led to steady rise in cargo traffic

Figure: Condition of Roads along the KUS Corridor



Containerized Cargo Traffic at Mombasa Port

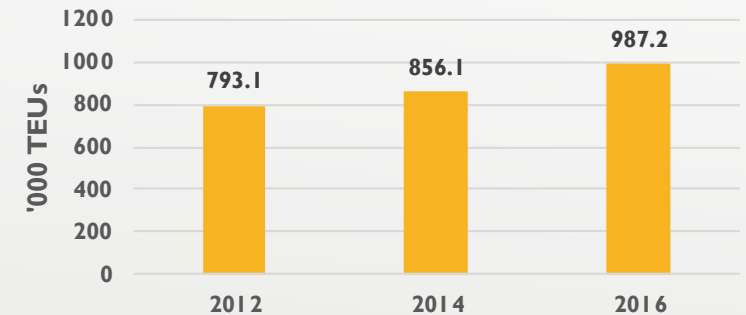


Progress in C-B infrastructure: Transport

□ Ethiopia-Djibouti Corridor:

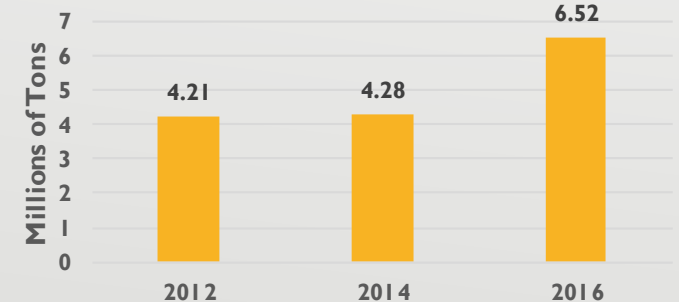
- Road & SGR link to Djibouti ports
- 97% of Ethiopia's international trade
- Road Conditions:
 - Ethiopian side (765km) in 'good' condition.
 - Djibouti side (245km) in 'poor' condition.
- SGR:
 - Operational in 2018
 - Lower freight tariff (USD 1200 for a 40ft container from Addis Ababa to Djibouti compared to USD 2500 by truck)
- Djibouti Ports:
 - Recent developments led to steady rise in cargo traffic

Containerized Cargo Traffic at Djibouti Ports



Source: UNCTAD (2018)

Non Containerized Cargo Traffic At Djibouti Ports



Source: UNCTAD (2018)

Progress in C-B infrastructure: Transport

❑ The Lamu Port-South Sudan-Ethiopia (LAPSSET) Corridor

- Road, SGR and a port (Lamu)
- The road link along the Kenya-Ethiopia line is half complete in Kenya, being upgraded in Ethiopia.
- The SGR and the port are at early stage of implementation (difficulty in securing finance)
- Lamu Port will be alternative gateway to Ethiopia and South Sudan.

❑ Other Corridors

Corridor Name	Description	Status	Merit
Ethiopia-Somalia Road Corridor	937Km	Upgraded on Ethiopian side and being upgraded on Somalia side	Links Ethiopia to Berbera port
Ethiopia-Sudan Road Corridor (port Sudan corridor)	1666km	Rehabilitated & upgraded	Ethiopia commenced oil import from sudan Ethiopia exports agri products to Sudan
Ethiopia – Eritrea Road Corridor (Assab/Massawa)	Assab (843KM) Massawa (1129 KM)	Rehabilitation of the Assab corridor is under way on both sides of the border	Alternative gateway to Ethiopia's international trade

Progress in C-B infrastructure: Power

□ HoA has one of the highest potentials in renewable energy sources

- Ethiopia: 45000 MW from hydropower alone (power Africa, 2015)
- Kenya: 10000 MW from geothermal and 3000 MW from wind power (power Africa, 2015)
- Uganda: 5300 MW from renewable resources (IHA, 2018)
- Sudan: 4860 MW from hydropower and 400 MW from geothermal (UNEP, 2017)
- Somalia has the largest potential for onshore wind power generation in Africa (AfDB, 2015)

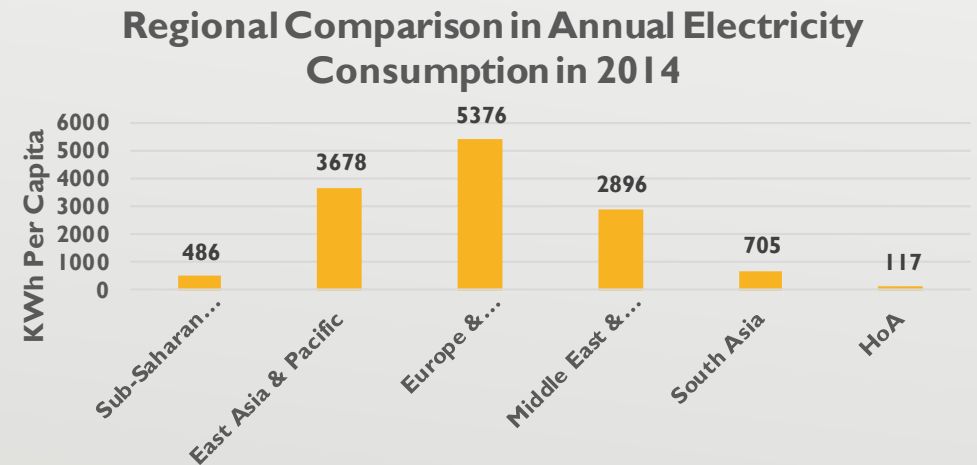
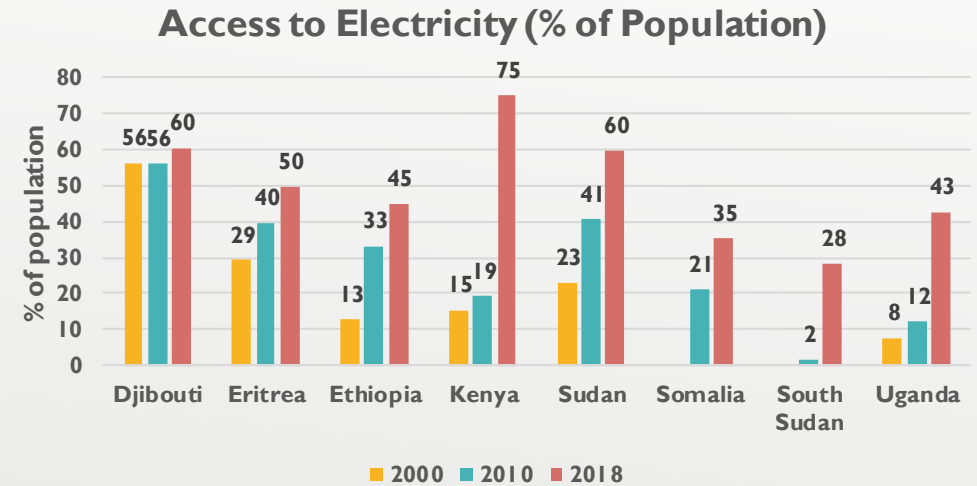
- But, largely untapped until recently
- Recent pressure on demand led to increased investment in power generation

Installed capacity for Electric Power Generation in 2018

Country	Total Capacity (MW)	Renewable Sources (%)				Non-Renewable Sources (%)
		Hydro	Solar	Wind	Geothermal	
Djibouti	123	-	-	-	-	100
Eritrea	205	-	5	-	-	95
Ethiopia	4537	84	-	7	-	2
Kenya	2823	30	3	12	23	29
Somalia	111	-	6	3	-	90
South Sudan	172	-	-	-	-	100
Sudan	3885	50	-	-	-	45
Uganda	995	73	5	-	-	14

Progress in C-B infrastructure: Power

- ❑ Significant improvement in access to electricity during 2000-2018 (esp. Kenya, Sudan and Uganda).
- ❑ Nevertheless, the HoA has one of the lowest electricity consumption per capita.
- ❑ Reasons for low electricity consumption vary across countries:
 - Ethiopia, Kenya & Uganda produce surplus but lack enough TLs.
 - Djibouti and Sudan have production deficit, and the existing TLs allow little import
 - Eritrea, South Sudan and Somalia don't have TLs
 - South Sudan and Somalia don't have interconnected national grids



Progress in C-B infrastructure: Power

□ Strong Rationale for Power Trade in the HoA:

- Demand-Supply balance projection for 2040:
 - Ethiopia, Kenya, Uganda will continue to have surplus electricity
 - The remaining countries will continue to have deficit (Power Africa, 2015).
- Cost of electricity generation is much cheaper in some countries than others:
 - Unit cost of generation is 0.03USD in Ethiopia vs 0.10USD in Djibouti or 0.30USD in Sudan.
 - Djibouti saved USD 36 million due to access to cheaper electricity from Ethiopia (2011).
 - Ethiopia earned USD 66.4 million from electricity export to Sudan and Djibouti(2020).
- Allows some countries to close power plants from fossil fuels
 - Djibouti reduced its domestic power production by 37% in 2011 when it started importing electricity from Ethiopia (IRENA, 2015)

Progress in C-B infrastructure: Power

- ❑ However, there is only intermittent C-B trade:
 - Reason: existing TLs are only few and with limited transmission capacity.

Selected Interconnection project status in the region, as of June 2020

Transmission Line	Size(length)	Capacity (MW)	Status
Ethiopia-Djibouti	230KV (283km)	60	Operational
Ethiopia-Sudan	220KV(335km)	300	Operational
Uganda-Kenya	132KV	4	Operational
Ethiopia-Kenya	500KV-DC bi Pole (1120KM)	2000	Construction at advanced stage
Ethiopia-Sudan	500KV, 4 circuits (570km)	3200	Feasibility study completed
Uganda-Kenya	400KV, 2 circuits (254km)	300	Construction partially complete

Progress in C-B infrastructure: ICT

- Significant progress in mobile subscription (2005-2018):
 - Kenya and Sudan made the largest improvement
 - Eritrea made the least improvement

- Share of individuals using the internet (%) grew from an average of 0.12% in 2000 to 19.75% in 2017:
 - Djibouti and Sudan making the highest improvements
 - Eritrea, Somalia and South Sudan have made little improvement

Trend in Mobile cellular subscription per 100 inhabitants

Countries in the HoA	2005	2010	2015	2018
Djibouti	5.6	19.7	34.4	41.2
Eritrea	1.4	5.8	14.2	
Ethiopia	0.5	7.8	42.0	
Kenya	12.6	59.4	78.8	96.3
Sudan	4.7	52.4	71.8	72.0
Somalia	4.8	5.4	42.3	51.0
South Sudan		15.8	27.1	33.5
Uganda	4.8	39.6	52.9	57.3

Source: HESPI computation using data from WDI database

Share of Individuals using the internet (%) during 2000-2017

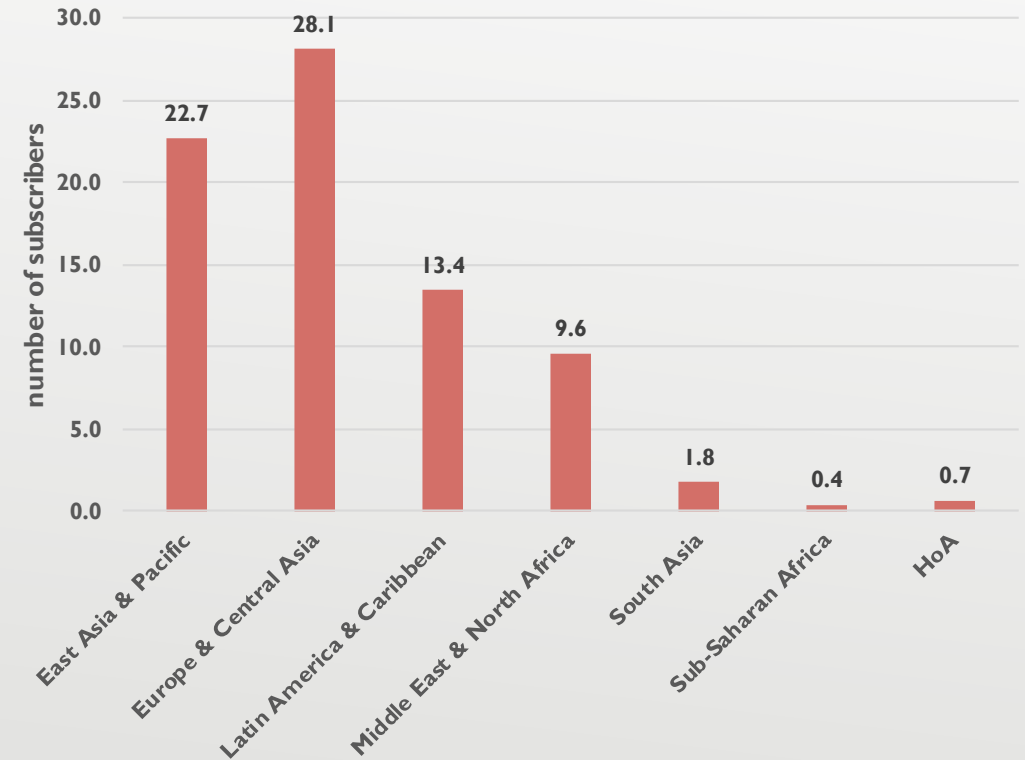
Country	2000	2005	2010	2015	2017
Djibouti	0.19	0.95	6.50	11.92	55.68
Eritrea	0.14		0.61	1.08	1.31
Ethiopia	0.02	0.22	0.75	13.86	18.62
Kenya	0.32	3.10	7.20	16.59	17.83
Sudan	0.03	1.29	16.70	26.61	30.87
Somalia	0.02	1.08		1.76	2.00
South Sudan				5.50	7.98
Uganda	0.16	1.74	12.50	17.83	23.71

Source: HESPI computation using data from WDI database

Progress in C-B infrastructure: ICT

- ❑ Despite the recent improvements, the HoA region still ranks among the lowest in ICT access:
- ❑ Low investment in land based ICT infrastructure:
 - Submarine Cable landing stations laid on seabed to carry telecom signals
 - Fiber optic connectivity to submarine cables allow competitive price for international bandwidth compared to satellite

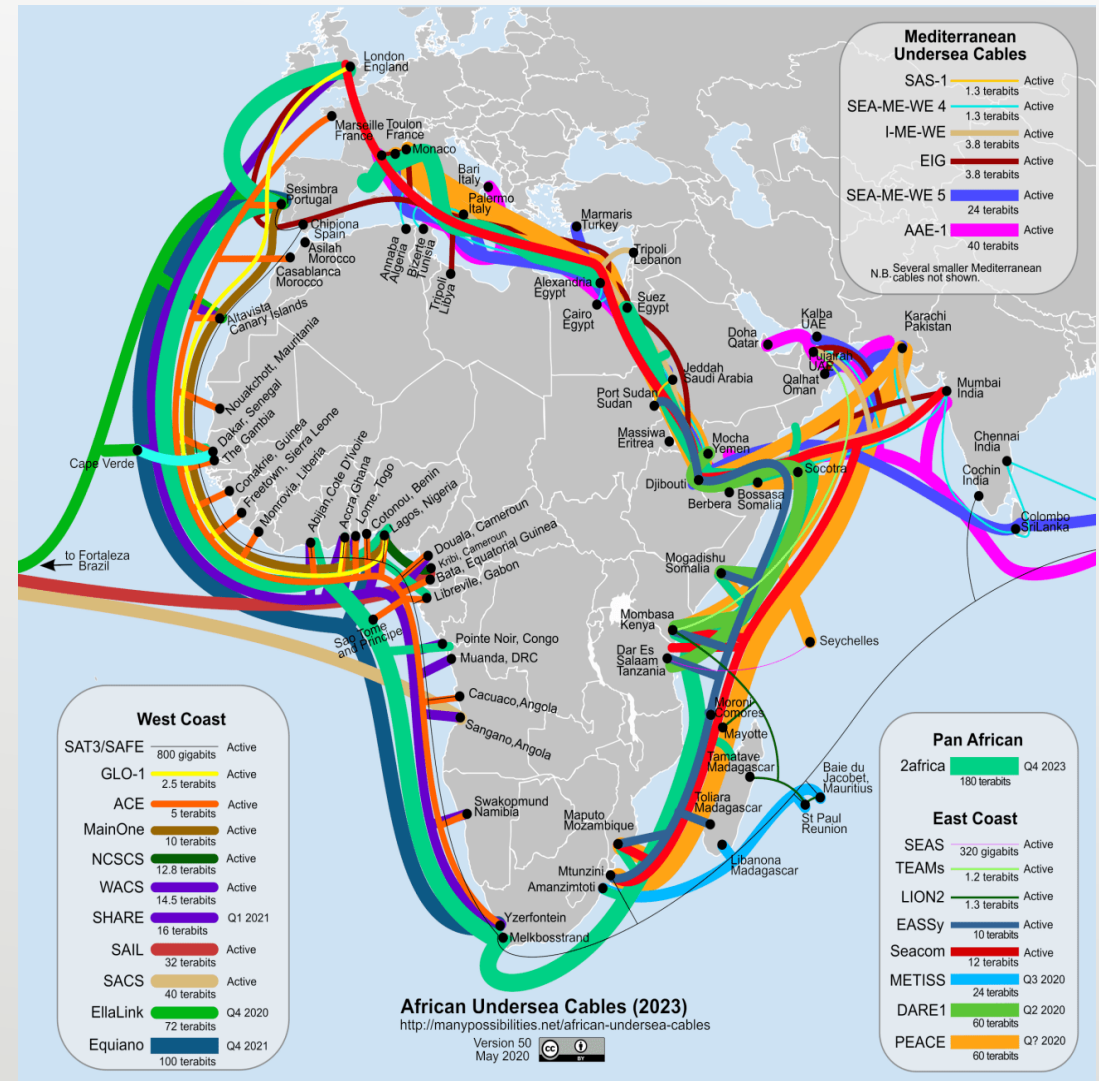
Regional Comparison Of Fixed Broadband Subscription Per 100 Inhabitants (Year 2018)



Progress in C-B infrastructure: ICT

- ❑ Since 2012, a number of consortiums built more than 70 submarine cables along all coast of Africa.
- Submarine cable landing stations in HoA: Djibouti, Kenya & Sudan.
- Terrestrial fiber optic connectivity: Ethiopia, Uganda and Somalia
- South Sudan and Eritrea yet to have submarine cable connectivity

Submarine Cables landing along the Coast of Africa



Features of C-B Cooperation, challenges and lessons

- C-B infrastructure involves two or more countries with different policy priorities, legal systems, political leadership, institutions.
- Success in implementation and operation depends on:
 - addressing political economy issues
 - negotiation and agreement on design, cost-benefit distribution
 - coordination of institutions, harmonization of national laws and policies
 - establishment of supranational institutions
- What is the experience in the HoA?

Features of C-B Cooperation, challenges and lessons

□ Political Economy Issues

- Growing sense of political and economic interdependence among countries
- Significant decline in conflict between and within countries
 - Recent Ethio-Eritrea normalization of relations led to:
 - Upgrading of C-B road connectivity, opens Potential for investment in port development, power TLs and fiber optic connectivity.
 - Remaining challenge: conflict in Somalia and South Sudan with implied poor credit rating

Features of C-B Cooperation, challenges and lessons

□ Intergovernmental Coordination and Policy Harmonization:

- Mixed experience
 - Some projects demonstrated strong intergovernmental coordination in joint planning, implementation and operation.
 - Ethio-Djibouti Railway
 - In other projects, no such strong cooperation, leading to delay in implementation.
 - Ethiopia-Northern Somalia Corridor
 - Sudan-Eritrea road corridor
 - KUS SGR
 - Efforts to establish autonomous supranational institutions faces challenge
 - Ethio-Djibouti Road Transport Authority not realized

Features of C-B Cooperation, challenges and lessons

□ Institutional Capacity

- Institutional capacity shortages in project identification, contract management, project management (KII, studies by GIZ/NEPAD)
 - Formalizing a project idea, demonstrating the need and level of priority are key for donors to finance the study for full scale feasibility study.
 - Capacity shortages relating to contract management and project management, leading to stalling of projects and incurring unnecessary cost.
- Few regional centers of excellence provide capacity building
 - Ethiopian Railway Academy
 - Africa's Geothermal Center of Excellence in Kenya

Features of C-B Cooperation, challenges and lessons

□ Regional Cost-Benefit Distribution Analysis:

- C-B cooperation in the HoA involve national cost-benefit analysis. But, they don't show the asymmetric distribution of cost and benefits among participants.
 - not all countries involved would benefit equally from a given C-B infrastructure.
 - there are also negative/positive externalities that spill over across the border
- Regional cost-benefit distribution analysis:
 - helps ensure costs burdens are aligned with benefits
 - involve compensation packages for those that bear disproportionately bear cost burdens

Features of C-B Cooperation, challenges and lessons

□ Regional Cost-Benefit Distribution Analysis: Lessons from Case Studies

- Northern Economic Corridor (NEC) of the GMS:
- NEC was designed to link Thailand and the PRC through Laos PDR (a transit country)
- Regional cost – benefit distribution analysis reveals disproportionately higher benefits to PRC and Thailand from road link improvement and connections
- To compensate Laos PDR for the otherwise unfavorable distributional outcome, a compensation mechanism was built as an integral part of the project design:
 - The PRC and Thailand provided concessional loans at favorable terms to Laos.
 - Inclusion of isolated regions of the northern Laos in the corridor design
 - ADB was proactively involved in the negotiation and design of the compensation package

Features of C-B Cooperation, challenges and lessons

□ Financing

- Modest progress in domestic resource mobilization in the region. Accordingly, domestic share of financing C-B infrastructure projects is increasing.
 - Example: 30-40% of the SGR in the region
- Given the big gap in regional infrastructure, still heavy reliance on funding from development partners:
 - AfDB, EU, Chinese EXIM bank, JICA, among others.
- Encouraging signs of private sector investment in:
 - port development (Djibouti, Somalia)
 - Building expressway (Kampala-Jinga expressway being conducted through PPP)
 - power generations (Uganda and Ethiopia).

Features of C-B Cooperation, challenges and lessons

□ Financing: Challenges

- The challenge to access external finance vary across countries:
 - The prolonged US sanctions on Sudan made borrowing and attracting FDI difficult for 2 decades.
 - Somalia insecurity and high debt overhang, before the recent HIPC relief, and continued civil conflict in South Sudan
 - Many of the early project proposals lack a domestic financing component, signaling lack of commitment
 - Capacity shortages in early stage project preparation
 - demonstrating need and priority
 - Climate and gender aspects

Features of C-B Cooperation, challenges and lessons

□ Bilateral vs Regional (Centralized) power market :

- Currently, only bilateral power trade in the HoA.
- But, centralized/regional power market have more merits:
 - More than one major power supplier
 - No need for direct connection between trading countries
 - Incentive to set up a network of transmission lines
 - Leads to standardized grid codes, harmonized trade rules, allowing seamless regional power trade (rise in regional trade volume)
 - Allows more reliable, secure and sustainable access to cheap and clean power regionally.
 - East African Power Pool (EAPP) was established to be future regional power market

Features of C-B Cooperation, challenges and lessons

□ Bilateral vs Regional (Centralized) power market (Cont'd)

- The East African Power Pool (EAPP):
 - Established in 2005, is a specialized institution of COMESA region
 - EAPP assists member states preparing towards the regional market:
 - operational readiness (grid code harmonization)
 - commercial readiness (trade rules harmonization)
- Availability of a network of transmission lines is key
 - Currently, only few exist, some are ongoing.
 - Ethiopia-Kenya interconnector will be significant step forward.

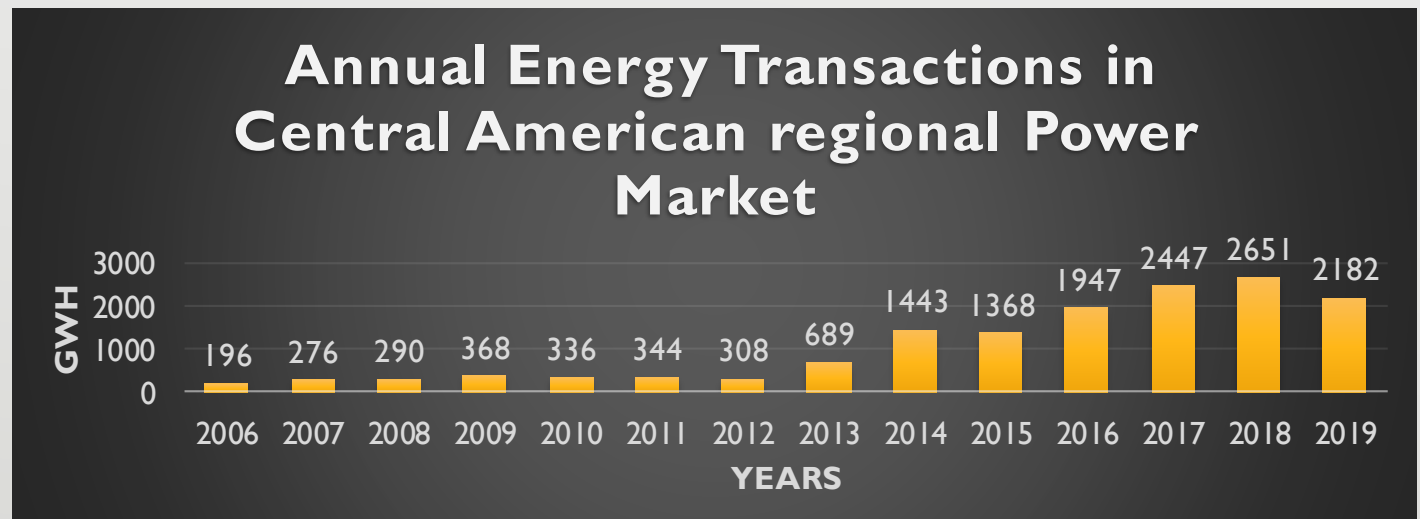
Features of C-B Cooperation, challenges and lessons

□ Lessons from Central American Electrical Interconnection System (SIEPAC) for a successful transition to regional power market

- In 1996, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica and Panama signed a treaty for a **Central American Electricity Market**.
- The **treaty** require the establishment of **three regional institutions**:
 - regional policy coordinator (CDMER)
 - regional regulator (CRIE), and
 - regional system and market operator (EOR).
- A special purpose company called EPR, was set up to own and operate the existing interconnections as well as build new ones.

Features of C-B Cooperation, challenges and lessons

- Lessons from Central American Electrical Interconnection System (SIEPAC) for a successful transition to regional power market
 - The treaty explicitly require the **national and regional institutions to coexist** until a full-fledged regional market is developed.
 - The national regulators approve firm contracts, CRIE enforce them.
 - Regional market and bilateral market coexist
 - As regional transmission networks grow, countries have incentive to transition from bilateral PPAs to adopting region-wide rules and agreements.
- In 2013, regional rules and national harmonization was implemented, causing regional electricity trade took off



Features of C-B Cooperation, challenges and lessons

- Lessons from Central American Electrical Interconnection System (SIEPAC) for a successful transition to regional power market
 - The SIEPAC experience shows:
 - Bilateral power trade is a good step towards a centralized power market.
 - Construction of new generation and transmission facilitates for bilateral trade will be backbones of future regional power market.
 - As regional transmission networks grow:
 - Number of suppliers and buyers grow
 - Suppliers have incentive to tap in to a big market by adopting regional trading rules
 - Buyers have incentive to access competitive and reliable power market by accepting regional trading rules
 - An enforceable treaty is key for countries to adopt regional institutions and laws.

Features of C-B Cooperation, challenges and lessons

□ Role of External Institutions in C-B infrastructure cooperation in the HoA

- Donors (e.g. AfDB) play key role in financing and providing technical assistance.
- NEPAD and GIZ-AU provides advisory support on early stage project preparation.
- Lesson from other regions show that they shall play a more proactive role for a more effective C-B infrastructure cooperation.
 - Involve in the negotiation and design stage to ensure win-win cooperation (e.g. ADB involved in designing incentive package for Lao PDR in GMS NEC)
 - Donors can leverage their lending to enforce countries to adopt treaties for shared regional benefit. (e.g. IADB made financial support to CIEPAC contingent on adoption of the treaty)

HoA-Gulf Cooperation

- Although geographically close, the HOA – Gulf engagement has been limited.
- Since 2000, a rise in trade and investment ties:
 - Investment projects rose from less than 10 in 2000 to more than 50 in 2012 (NIIR, 2018)
 - Most of the Gulf investments concentrate in Ethiopia and Sudan and to some extent in Djibouti and Somalia
 - C-B infrastructure cooperation mostly limited to port developments (Djibouti and Somalia)

Number of Gulf Investments in the Horn of Africa (2000-2017)

		National Alignment of Investor			
		Saudi Arabia	UAE	Qatar	Kuwait
Recipient	Ethiopia	233	104	12	16
	Sudan	16	19	4	13
	South Sudan	1	2	2	1
	Somalia	1	5		
	Djibouti	1	3		

Source: NIIR (2018)

HoA-Gulf Cooperation

□ Promoting infrastructure cooperation in the Red Sea Arena

- The Gulf Cooperation Council (GCC) **sovereign wealth funds and logistics firms** can invest in **HOA's rising demand for infrastructure** investment and logistics development:
 - Deep water ports
 - Auxiliary investments in industry parks that made SGR viable
 - Components of LAPSSET corridor seek funding
 - Galafi-Djibouti Road corridor upgrading
 - Planned power transmission line between Egypt-KSA

The Way Forward

□ HoA Countries:

- Enhance **human resource capacity** in *early stage project preparation, contract management and project management*:
- Institute **regional cost-benefit distribution analysis** from the design stage to avoid asymmetric distribution of costs and benefits.
- Enhance **domestic resource mobilization**, as donor finance is increasingly tied to domestic resource commitment.
- Pursue **reform to encourage private investment and PPP** in highway construction, power generation, fiber optic cable construction to ease financial burden
- Adopt a **corridor approach** in implementing C-B infrastructure to exploit the synergy (e.g. deploying fiber optic cables along highways or power interconnectors)

The Way Forward

□ Regional Organizations (IGAD /NEPAD/AU):

- IGAD/AU should keep the momentum on **peace building** in Somalia and South Sudan, so these states can mobilize external resources.
- NEPAD as implementing agency for PIDA can **institute important features of C-B cooperation** (e.g. cost-benefit distribution analysis, adopting regional rules) as additional criteria while screening C-B infrastructure projects from RECs
- As Individual countries domestic saving are constrained, and their domestic financial markets are under developed, regional efforts **to establish collective investment funds** for C-B economic infrastructure should be pursued from both public sources and international markets.

The Way Forward

□ Regional Organizations (IGAD /NEPAD/AU):

- Existing power trade in the HoA through **bilateral PPAs should be promoted** to provide incentive for construction of TLs that will serve as building blocks for EAPP. Simultaneously, countries should be encouraged to **adopt an enforceable treaty** for:
 - Establishment of regional regulatory institutions that enforce regional contracts
 - Establishment of special purpose company that own TLs, standardize grid codes, market rules
 - Regional market that coexist with bilateral markets

The Way Forward

□ Development Partners (e.g. AfDB, GIZ-AU)

- **Advisory and technical support** programs in early stage project preparation, contract and project management shall be strengthened.
- support existing **regional centers of excellence** (Ethiopia Railway Academy, Africa Geothermal Center of Excellence) and establishment of similar institutions in other sectors
- **Proactively involve in the negotiation** to ensure project designs **ensure alignment of costs and benefits** for sustainable cooperation
- **leverage lending** to encourage countries to adopt **regional institutions, laws and policies** for shared benefit

Thank You!