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SLIDES: Impacts of Energy Deficits in Cooking, Illumination, Water, Sanitation, and Motive Power

Paul S. Chinowsky

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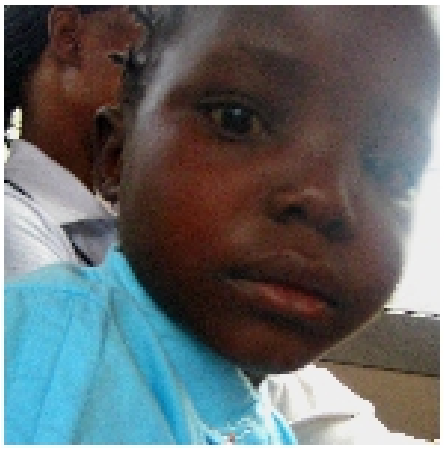



The Impact of Energy Deficits

- Individual Perspective
- Community Perspective
- National Perspective
- International Perspective

Individual Perspective

- Energy Affects Everything
  - No Refrigeration - Vaccines
  - No Illumination – Productivity and Education
  - Lack of Telecommunications
  - Lack of Pumping Infrastructure
  - Need for Natural Resources for EVERYTHING

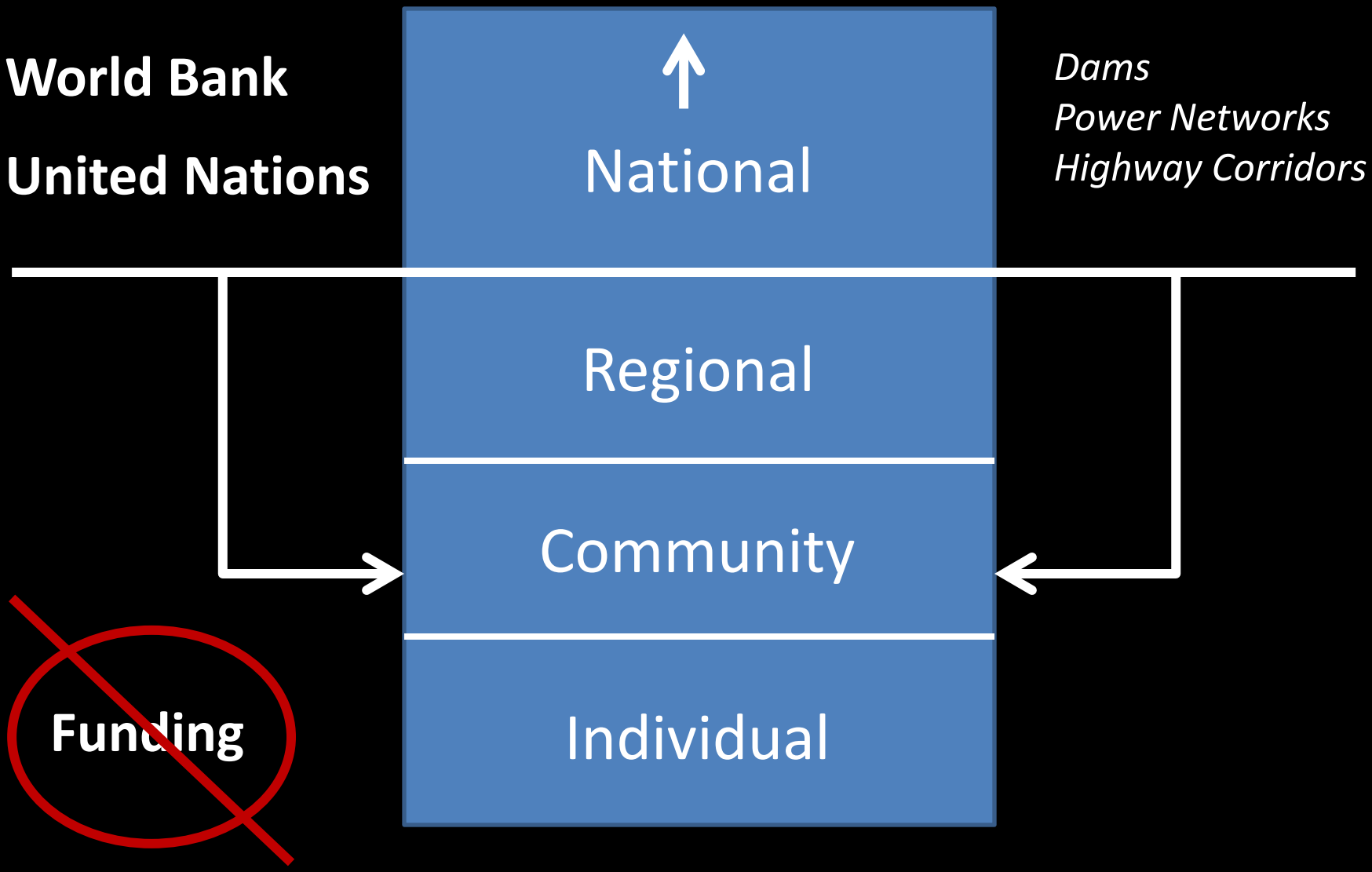
Individual Impact

- Children exposed to open-fire cooking in developing countries experience difficulty with memory, problem-solving and social skills.
- 75 percent of Sub-Saharan Africans, or 550 million people, do not have access to electricity. In South Asia, some 50 percent, or 700 million people, lack access.
- Energy investment is also falling in industrialized countries

The Development Dilemma

- Who are we trying to help?
- What are we trying to achieve?
- What are we trying to influence?
- What is the broader legacy?

The Vertical Placement

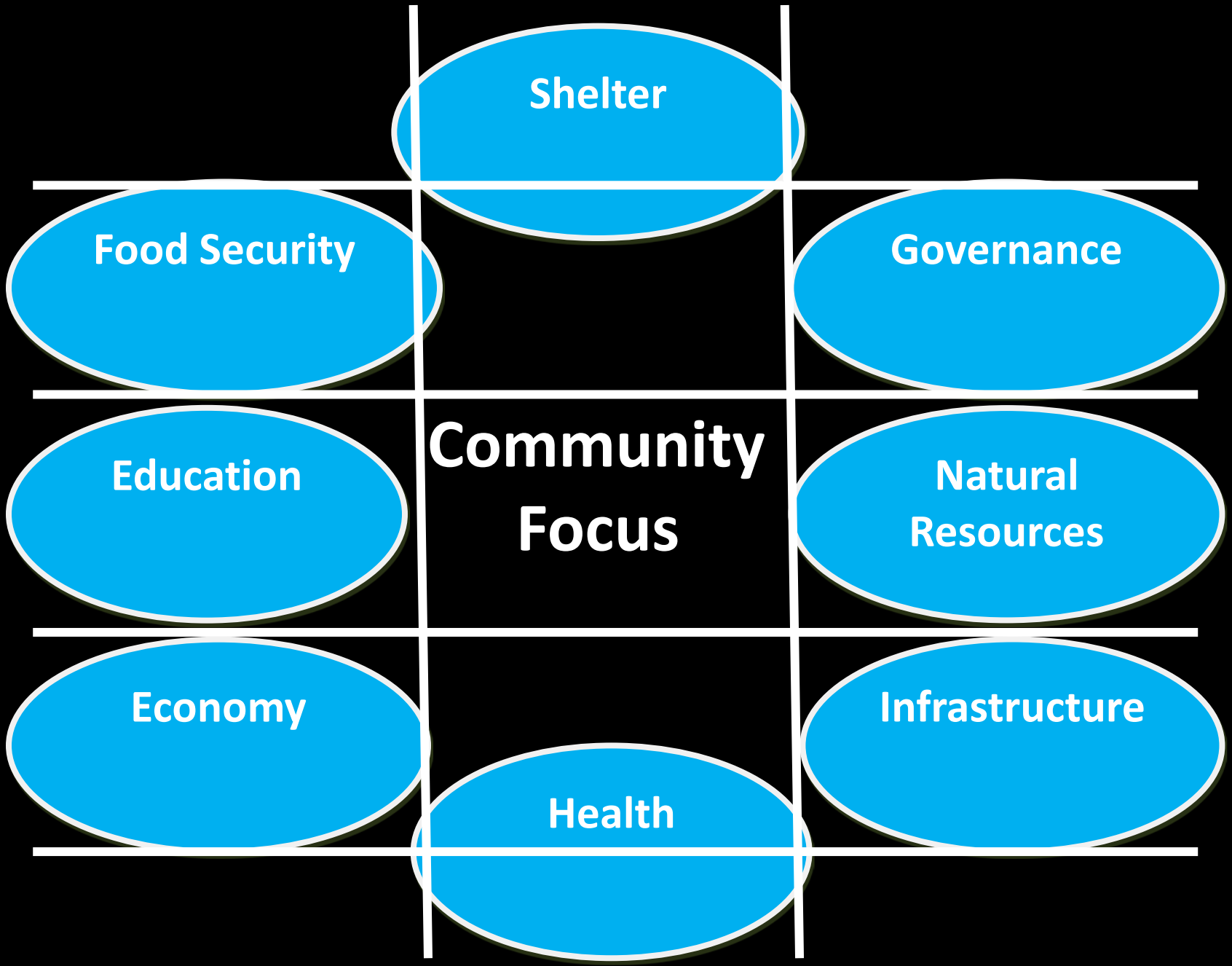


Infrastructure Planning

Planning requires long-term Outlooks

- Roads – 20-30 years
- Buildings – 30 – 50 years
- Dams – 100 years


Shelter
Food Security
Governance
Education
Community Focus
Natural Resources
Economy
Infrastructure
Health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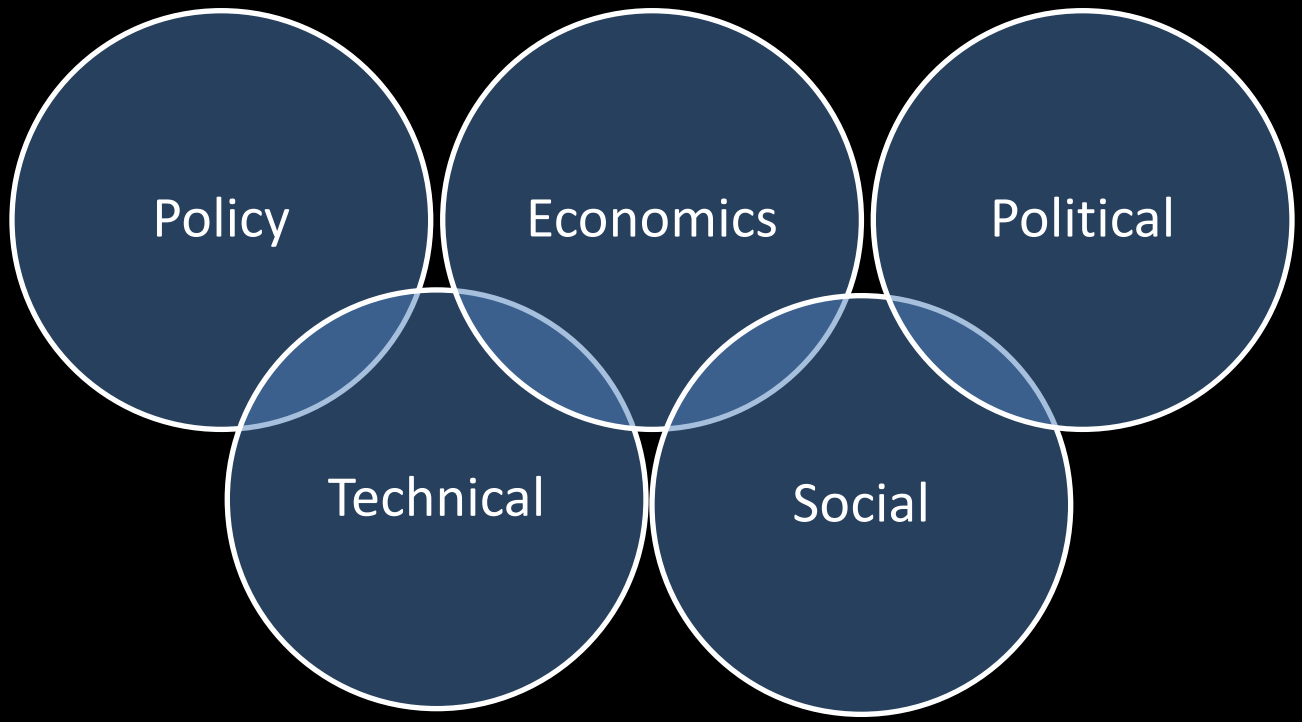
The Interconnected Picture



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A Lack of Infrastructure Resources

WHAT HAPPENS WHEN WE FORGET

Background: Africa

Table 1.3 International Perspective on Africa's Infrastructure Deficit

Normalized units	African low-income countries	Other low-income countries	African middle-income countries	Other middle-income countries
Paved-road density	34	134	284	461
Total road density	150	29	381	106
Main-line density	9	38	142	252
Mobile density	48	55	277	557
Internet density	2	29	8.2	235
Generation capacity	39	326	293	648
Electricity coverage	14	41	37	88
Improved water	61	72	82	91
Improved sanitation	34	53	53	82

Source: Yepes, Pierce, and Foster 2008.
Note: Road density is measured in kilometers per 100 square kilometers of arable land; telephone density in lines per thousand population; generation capacity in megawatts per million population; electricity, water, and sanitation coverage in percentage of population.

Some Statistics on Current Infrastructure

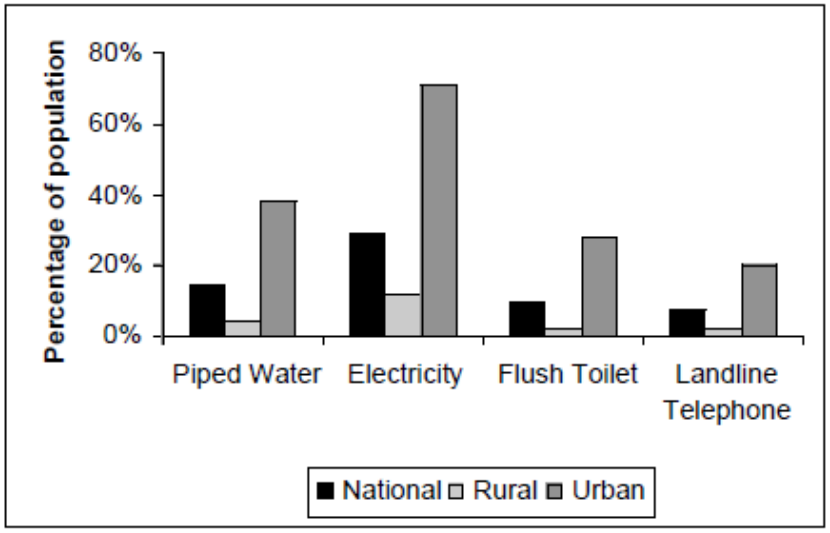
- **Electricity**
  - All of Africa (800 million ppl) has similar power generation to Spain (45 million ppl)
    - Equal to 3 hours of 1 100-watt lightbulb per person per day
- **Phones**
  - 1999-2006: 100 million new subscribers to mobile phones
  - In many countries: more access to phones than piped water!
- **Roads**
  - 1/3 of rural Africans don't have 2 km access to all-season roads (MDG goal)
  - Asset value of many road networks exceed 30% of country's GDPs
    - Presents a HUGE maintenance issue
- **Farmland**
  - Less than 5% of farmland is irrigated (accounts for >20% of farm revenue)

Access to Basic Services

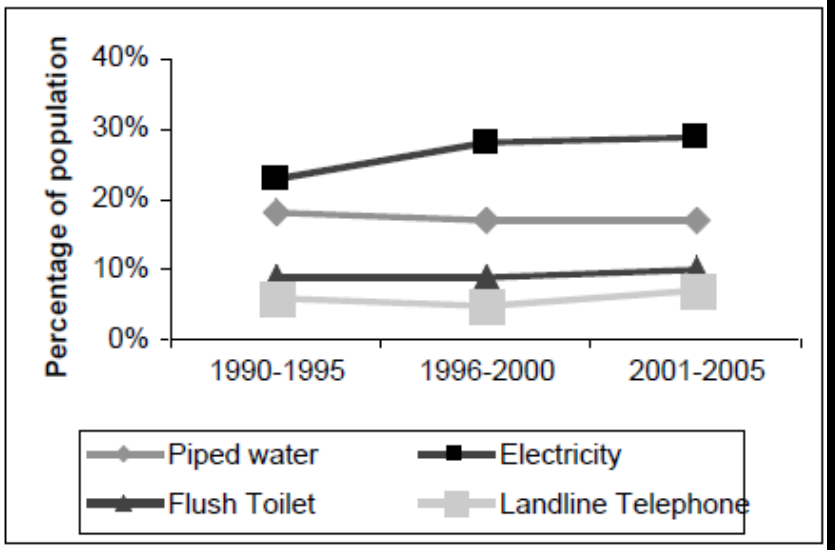
- If current trends continue, it will take 50 years for universal access to services in Africa
  - Due to population growth, urban coverage has decreased in recent years

Figure 1 Access to household services

(a) Rural-urban divide



(b) Stagnant trends



Source: Banerjee and others, 2008.

ICT & River Basins

Figure 2 Africa's *regional* infrastructure challenge

(a) ICT: closing the circle

(b) River basins: managing commons

Roads & Power: Existing and Needed

(c) Roads: connecting the dots

(d) Power: toward regional pools

Source: African Development Bank, 2008.

Estimated Needs

- Estimated $75 million USD/annum to bridge the gap in Africa's infrastructure needs
  - Equal amounts needed for New Expenditure and O&M
  - 50% needed for Power infrastructure investments
  - This adds up to 12% GDP per country average
    - Over 40% GDP for fragile states

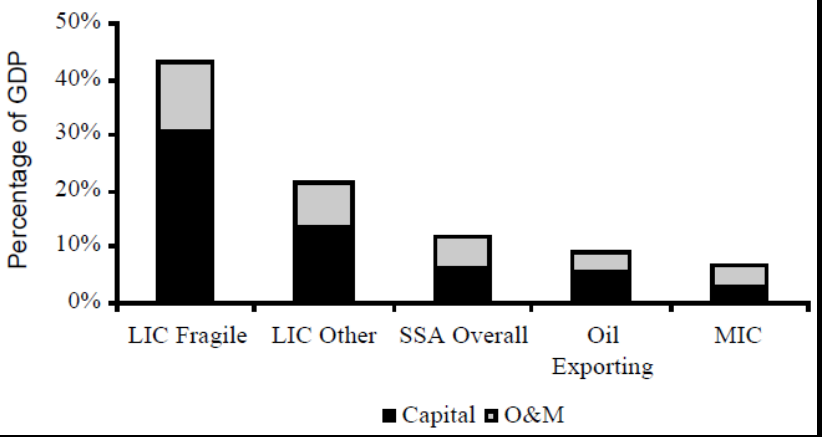
Table 3 Infrastructure spending needs for Sub-Saharan Africa

	US$ billion per year		
	Capital expenditure	Operations and maintenance	Total spending
ICT	0.8	1.1	1.9
Irrigation	0.7	—	0.7
Power	23.2	19.4	42.6
Transport	10.7	9.6	20.3
WSS	2.7	7.3	10.0
Total	38.1	37.4	75.5

Source: Briceño-Garmendia and others, 2008.

Note: Figures refer to investment (except public sector) and include recurrent spending. Public sector covers general government and nonfinancial enterprises.

Figure 3 The burden of infrastructure needs



Regionalism

The Current Gap

- Infrastructure is highly fragmented (legacy of colonialism)
  - Extremely low levels of inter-regional: power, transport, and fiber optic systems
  - 2008: only 16% of power generated is traded (all to/from South Africa)
- BUT: inter-regional development is key: most economies are too small to develop and support major systems
  - 60% of hydro-electric power potential in SSA is in Ethiopia and the Democratic Republic of Congo

To Close the Gap

- USD$500 million/annum invested in 28 GW of interconnectors to make Africa regional power pools connect and reduce cost from $0.30 kw/h to $0.10 kw/h
- Est. return of up to 160%

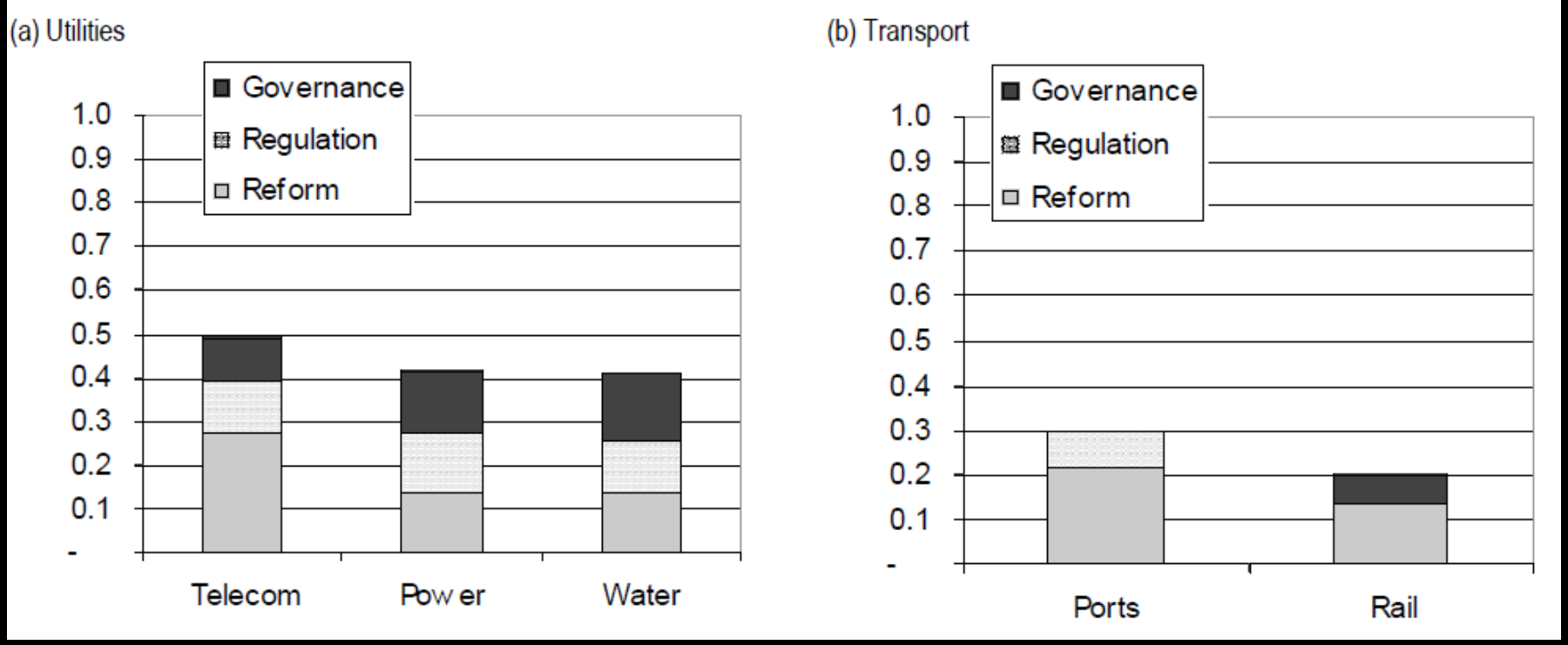
Impact

- Lack of infrastructure is a major constraint to doing business
  - Reduces firm productivity by 40%
  - Equal to: Corruption, Crime, Red Tape and limited Finance Markets
  - “Power” is the #1 most limiting factor
    - Electricity, **internet**, etc.

How to Address Necessary Changes?

- More Funding?
- Better Governance?
- Private or Public?

Figure 10 Status of institutional reform across infrastructure sectors

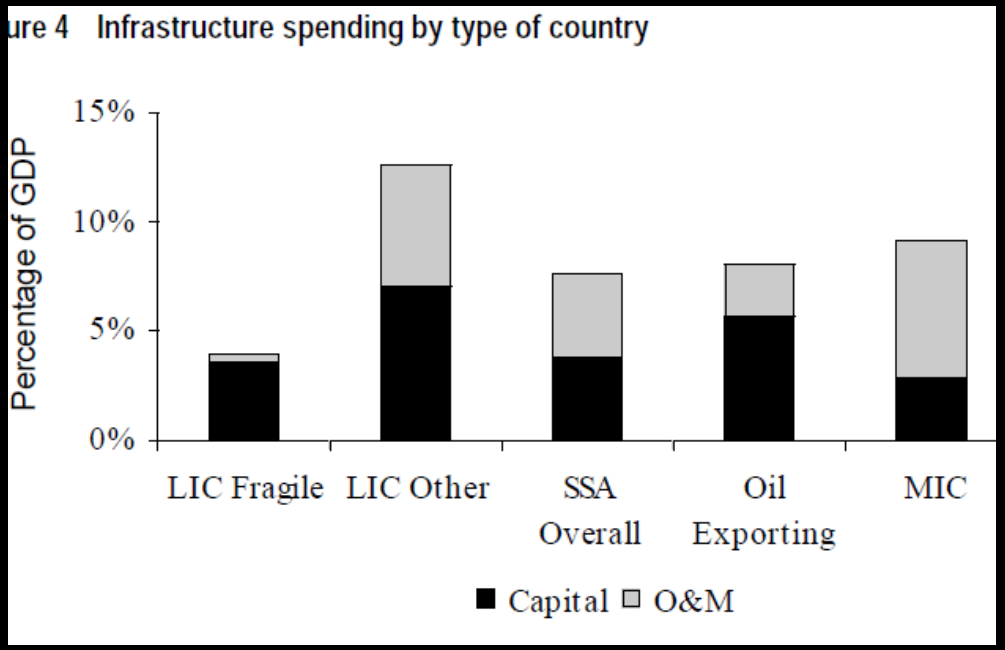


Current Spending

- Current expenditure on infrastructure could increase by 50% with *no added funding increase*

By:

- Addressing institutional bottlenecks;
- Better planning;
- Earlier completion of feasibility studies,
- Efficient procurement processes;
- Move to multi-year (medium term) budgeting

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