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Water as a Dimension of Land Use. Implications for Agricultural Intensification in sub-Saharan Africa.

P Woodhouse

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summary

- Problem of productivity and low production in African agriculture: rediscovery of the role of irrigation.
- Trajectory of irrigation development in Africa
- Learning lessons from irrigation experience
- Policy blind spot: land water linkages

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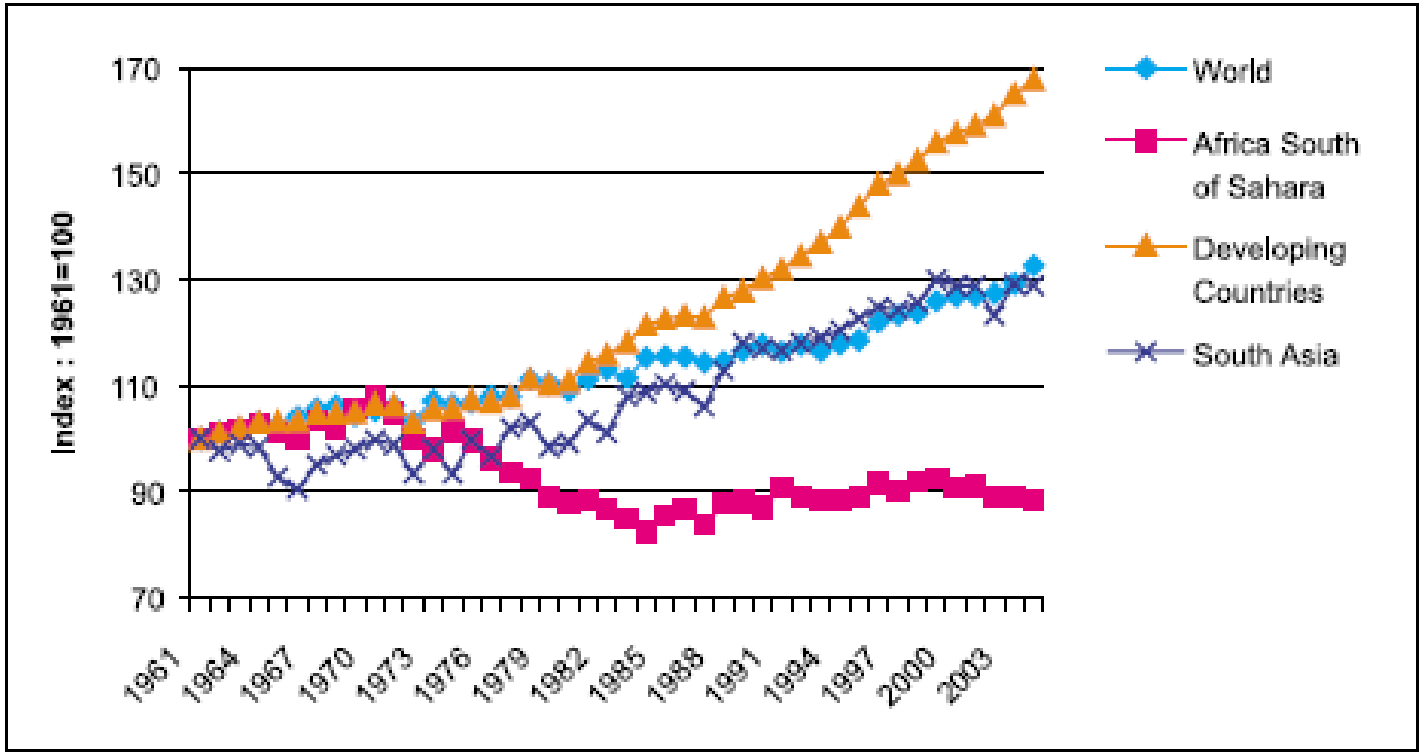
Per capita value-added output of agriculture



Source: FAOSTAT, 2006

Diagnosing the productivity problem: CAADP's 4 pillars

1. **extending the area under sustainable land management and reliable water control system**
2. improving rural infrastructure and market access
3. increasing food supply and reducing hunger
4. agricultural research and technology dissemination

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Historical trajectory of African irrigation development

- 1920s -1950s state-led ‘modernisation’: large-scale irrigation (Gezira model: small-scale tenants)
- 1960s -1970s Post-independence dams for national development (Aswan, Akasombo, Kariba etc):
- 1980s public debt crisis, structural adjustment,
- 1990s failure of large irrigation schemes: moratorium on large dams
- 2005 – return to investment in large water infrastructure (hydropower, irrigation??)

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Indicators of irrigation development (Svendsen et al, 2009)

African agro-ecological region.	"equipped" irrigation area / total area cultivated	% use of "equipped" irrigation area	Total area of water management / total area cultivated	"Equipped" irrigation as % of potential
Northern	28.1	80.4	28.1	88
Sudano-Sahelian	6.9	63.3	9.2	50
Gulf of Guinea	1.5	73.5	3.3	8
Central	0.7	47.5	2.8	1
Eastern	2.6	24.0	1.8	11
Southern	4.2	80.7	4.8	36
Indian Ocean Islands	30.4	99.4	30.7	71
Average Sub-Saharan Africa	**3.5**	71	**4.5**	18
Average Asia	33.6	66.9	34.3	

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Expanding irrigation (IRR>12%)

(You et al, 2010)

African agro-ecological region.	Large Scale (dam-based) irrigation			Small-scale ("local runoff") irrigation		
	Cost US$mn	hectares	IRR%	Cost US$mn	hectares	IRR%
Total SSA	**2,640**	**1,352,277**		**19,401**	**3,754,317**	
Sudano-Sahelian	508	260,064	14	4410	853,363	57
Gulf of Guinea	1188	608,755	18	8738	1,690,930	36
Central	4	2,028	12	1118	216,328	42
Eastern	482	246,847	17	4006	775,199	44
Southern	458	234,583	15	1129	218,497	28

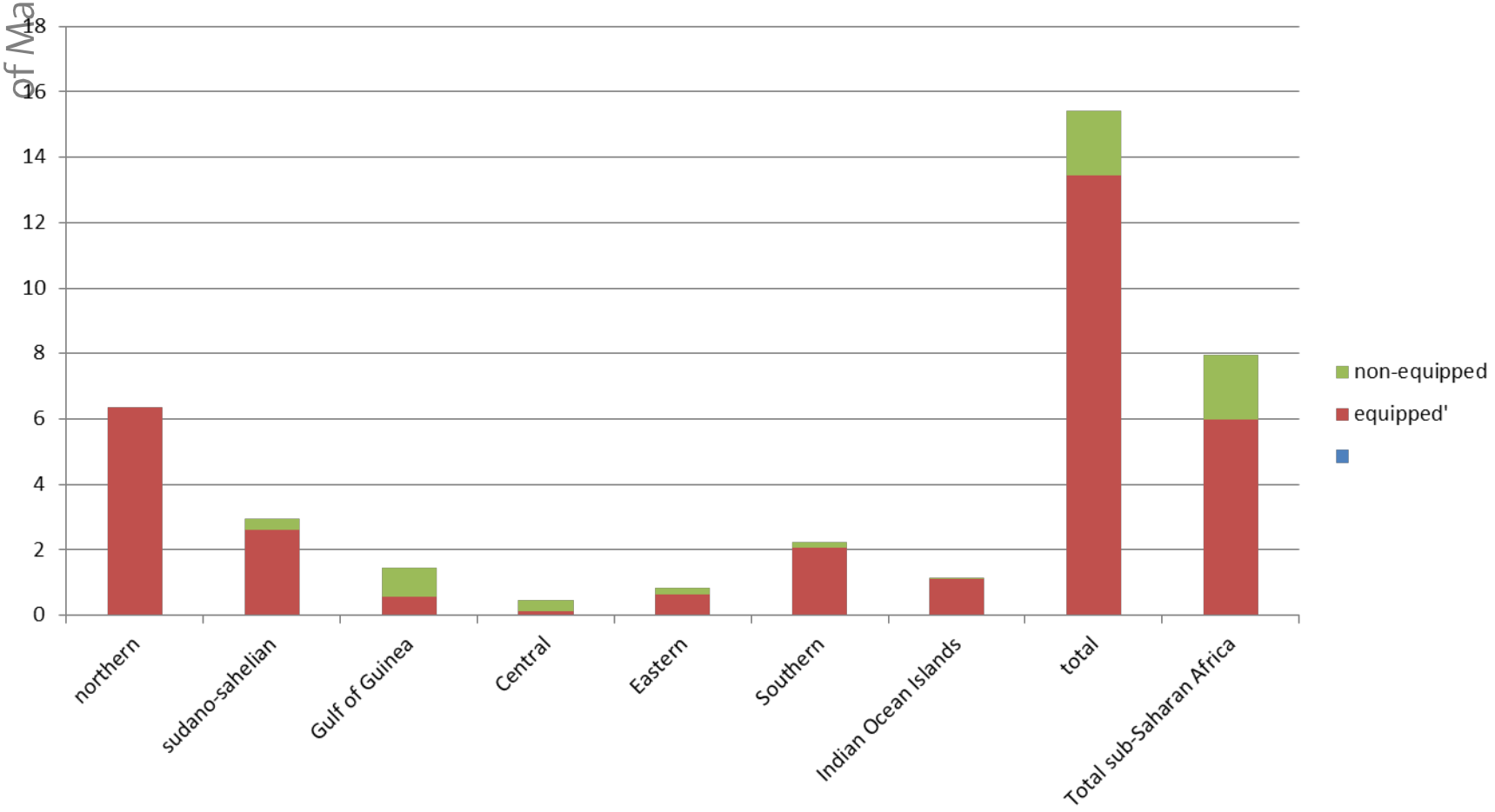
Current trends

- Large-scale private sector investment in agricultural land: irrigation implicit (sugarcane, bananas, wheat…)
- Funding initiatives for small-scale irrigation??
- Informal irrigation investment by small/medium scale farmers

Lessons from experience

- African irrigation has been expensive, mainly because it frequently failed (60% failure in 1970s) Inocencio et al, 2007
- where projects are successful, they are no more expensive than outside Africa.
- Small-scale irrigation is more productive, large projects more likely to succeed
- Reasons for failure:
  - poor engineering design (lack of data etc);
  - lack of market access (outputs, inputs)
  - lack of 'fit' of irrigation with rural livelihoods (opportunity costs of labour)

Formal vs informal irrigation (million ha) FAO 2005



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“Informal irrigation”

- “indigenous” water management
  - Both ‘irrigation’ and ‘soil and water conservation’
  - Continuum of investment intensity (planting site-selection, flood recession ←=→ furrows, terrace construction)
- Continuing adaptation / modernisation;
  - Peri-urban
  - Extensive hill furrow systems (E Africa)
  - Small-scale pump systems (Senegal, Nigeria)
  - Floodplain irrigation at periphery of ‘formal’ schemes

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Socio-economic context

- Labour markets, off-farm income and differential capacity to invest in agriculture.
- Differential capacity to adopt ‘labour-intensive’ water-management technologies (furrows, terracing, mulching, conservation ‘basins’)
- Mobility and in-migration to high-value areas: land markets.
- Response to market opportunities

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Policy blind spots?

- Invisibility of informal water management to development agencies
  - Definitions: ‘irrigation’ separate from ‘rainfed’
  - Informal initiatives ‘below the radar’ (scale, location)
- Continuing modernisation agenda
  - FDI land leases
- Missing opportunities? (new – adapted - models of water management?)
- Missing threats? (rising land value: increasing competition/inequality in access to land-with-water)