Africa, Dams and Development Panel Discussion

Oxford Martin School

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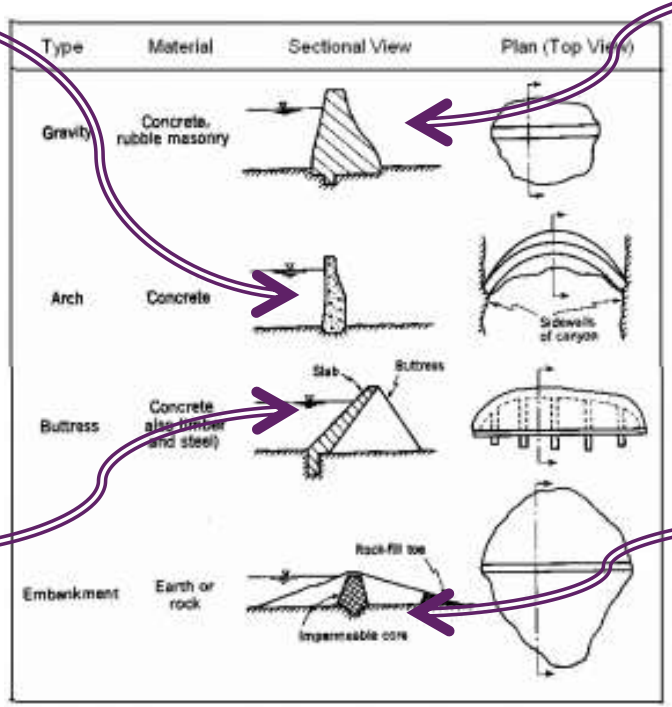
Traditional types of dam

•Hard rock at or near the surface
•Suited where the length of the crest is <5x height of the dam
•Less concrete than gravity dam

•Rock at or near surface.
•Concrete up to half of a gravity dam
•Skilled labour is required to create the formwork.
•lower uplift pressure

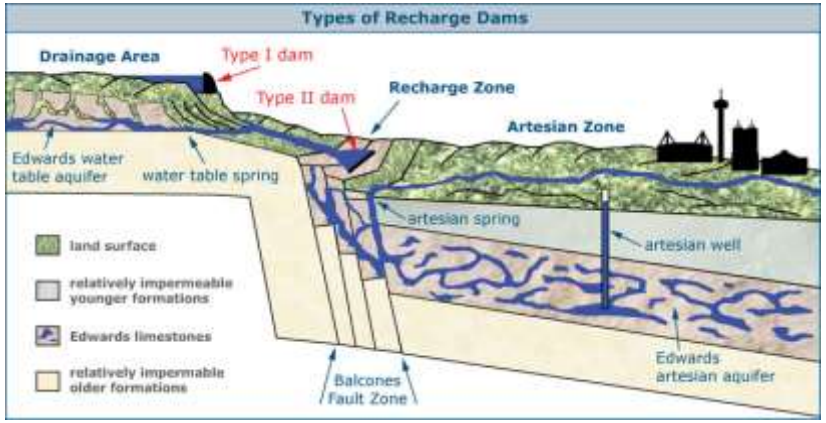


•Rock at or near the surface.
•Materials for concrete easily available
•Suited when the length of the crest is >5x height of the dam

•Variable foundation unsuitable for the weight of a concrete dam
•Rock in the vicinity
•Clay available for use as a core
•Site is suitable for heavy earth-moving machinery

Other types of dam and storage techniques

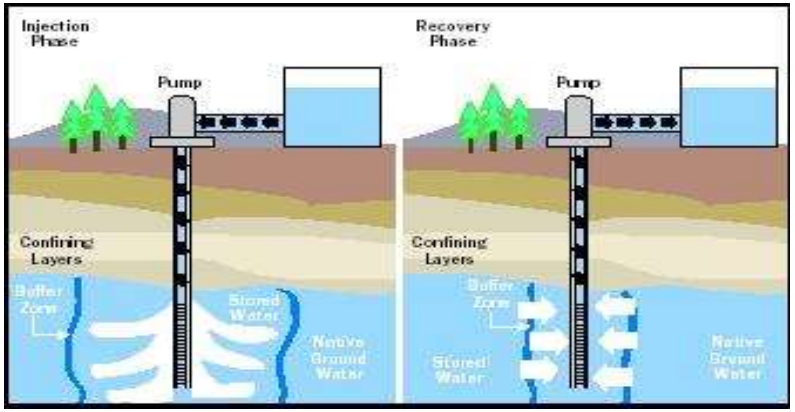
Recharge dams



Barrage

Levee

Managed Aquifer Recharge



What does a large dam cost to construct?

Kariba Dam, Zambezi river, Zambia/Zimbabwe
1960, cost £1bn. Height of 128 metres and flooded 5,477sq km, making it the largest man-made lake in the world. Produces 1,266 megawatts of power.

Tarbela Dam, Indus river, Pakistan

1976, cost £6bn. Height of 148 metres, flooded 240sq km. Created largest irrigation scheme in the world: 18m acres. Produces 3,478 megawatts of power.

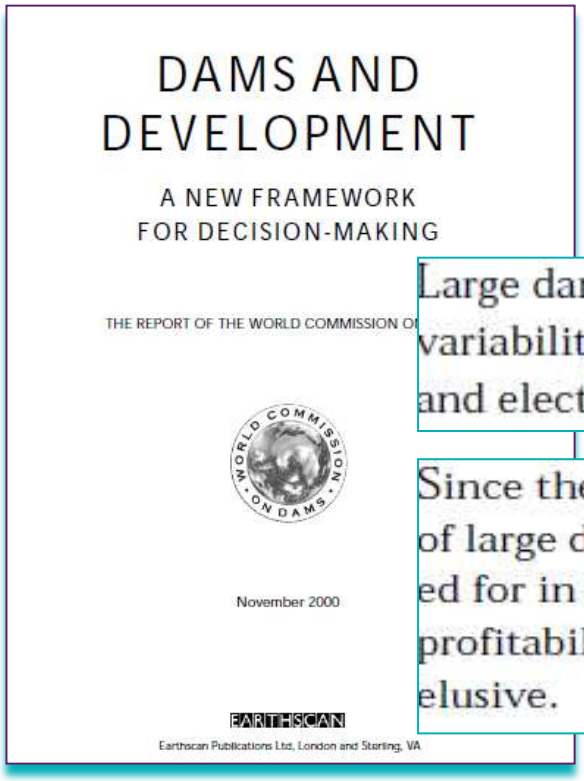
Grand Coulee, Columbia river, USA/Canada

1941, cost £6.5bn. Height of 170 metres, with 260 sq km reservoir.Capacity of 6,809 megawatts of power.

Tucurui Dam, Toccantis river, Brazil

1986, cost £4bn. Height of 78 metres, 2,430 sq km reservoir. 4,000 megawatts of power.

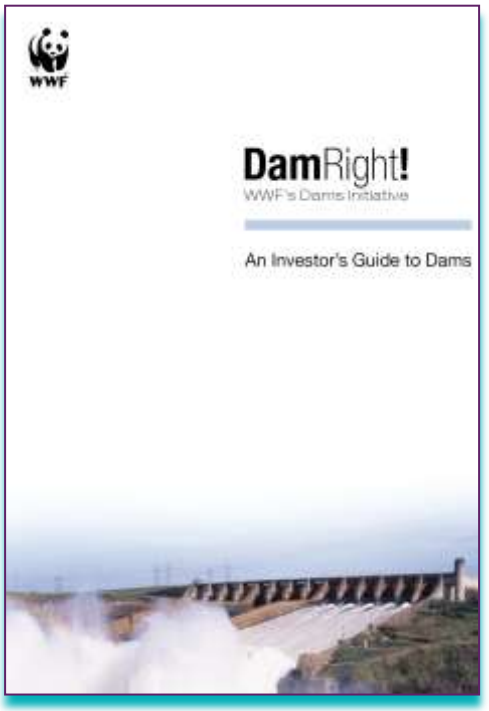
WCD, 2000; WWF, 2003



"…….while dams have indeed contributed to human development and provided considerable benefits, this has been achieved at a high price"

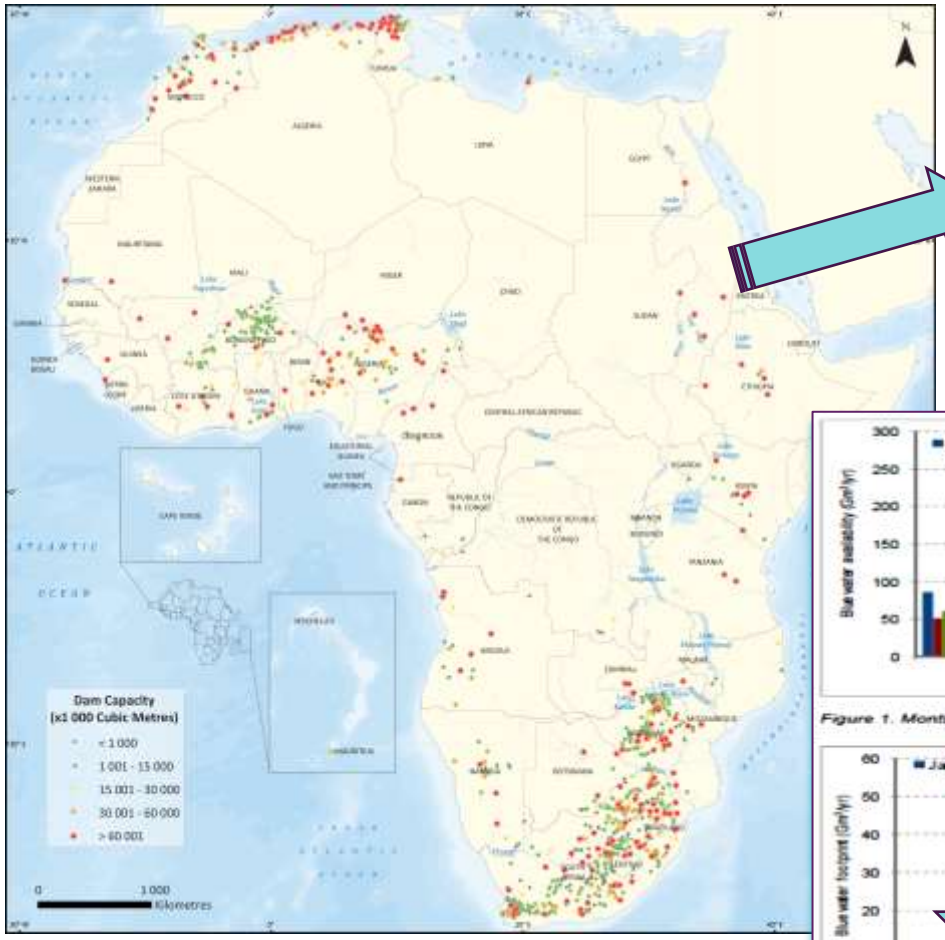
Large dams display a high degree of variability in delivering predicted water and electricity services – and related

Since the environmental and social costs of large dams have been poorly account-ed for in economic terms, the true profitability of these schemes remains elusive.



"...the WCD proposed a decision-making framework based on five principles: equity, sustainability, efficiency, participatory decision-making and accountability"

Dams and Renewable Water Resources in Africa



- Between 600 and 800 large dams (world 45,000)
- Rainfall 670mm (world 809 mm)
- Renewable water resources 4,000km3/yr (world 43,000 km3/yr)

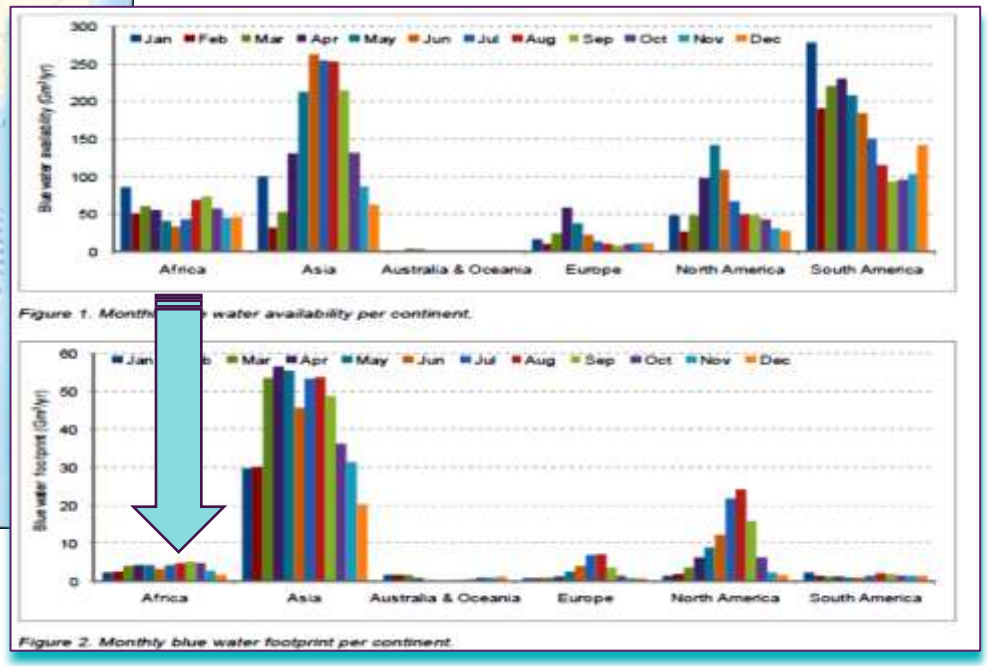


Figure 1. Monthly blue water availability per continent.

Figure 2. Monthly blue water footprint per continent.